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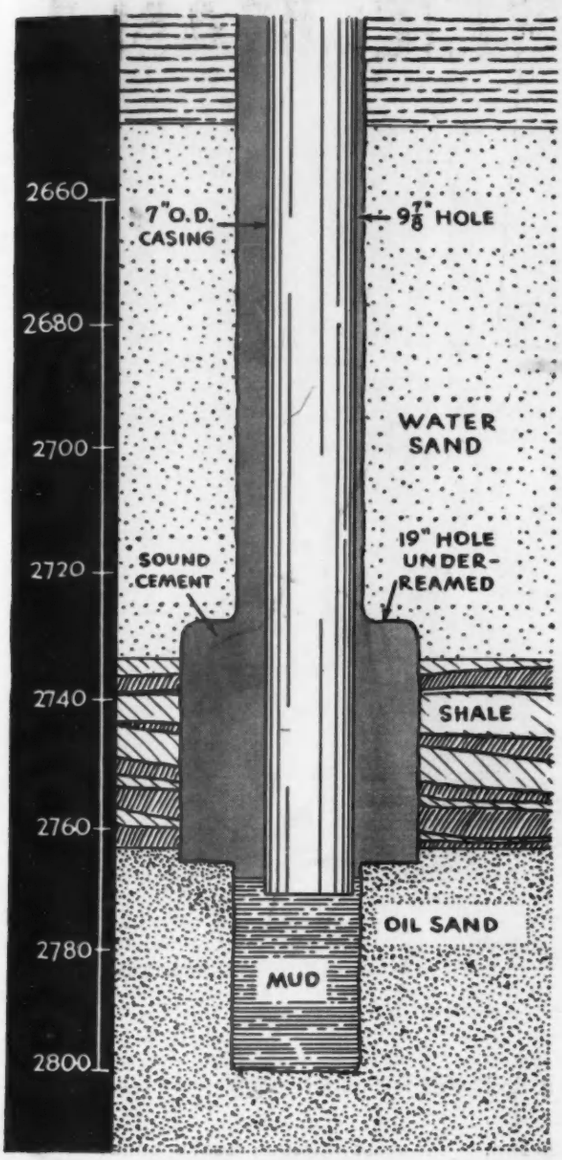
IS WATER EXCLUSION
A *problem* IN YOUR WELLS?



Modern methods have at last made it possible to successfully and permanently seal-off water strata located either above or below the oil sand. Even when the water sand is prolific and is separated from the producing zone by a narrow body of shale, results have been entirely satisfactory.

Here Is the "ENGINEERED" ANSWER!

UNDER-REAMING METHOD

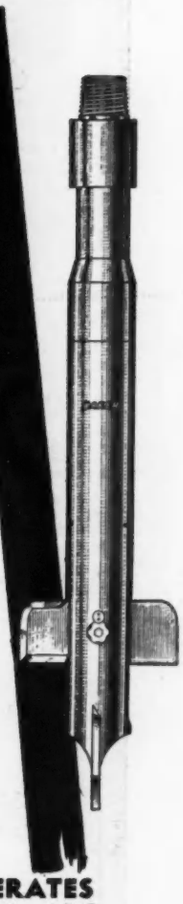
The second method of excluding water from producing wells is concerned primarily with the completion of wells through a prolific water sand occurring above the oil sand and separated from it only by a few feet (10 ft. to 20 ft.) of shale. Such a condition gives only a few feet between these two sands in which to seal off the upper water. Ordinary methods of casing cementing have been found to be unsatisfactory in shutting off this water due to the fact that the casing hangs to one side of the hole, thus preventing the cement from completely surrounding the pipe in these few feet.

In order to get a good cement seal at the casing shoe, it is necessary that the cement completely surround the casing. This requires that the casing hang free and be nearly concentric with the hole. To accomplish this, the hole is under-reamed to a larger size from a point 25 ft. or more above the casing seat down to the casing seat. The size of the under-reamed hole is usually sufficient to give at least 3 in. clearance between the casing and the wall. The casing is then run and cemented in the regular manner. Fig. 3 illustrates a typical casing-cementing job using this method to shut off upper water.

This method of cementing the oil-string casing has been used in a number of wells in a field that is troubled with this particular type of water condition, and has proved very effective in sealing off this upper water. The only additional cost of this method of cementing over the regular method is the rent of the under-reaming tool, and the rig rent for the time required in making one round-trip and under-reaming. Ordinarily, where not more than 25 ft. are under-reamed in the shale formation, only one set of blades is necessary. The relatively small cost of under-reaming is considered negligible compared with the added protection of the producing horizon obtained by this method of casing cementing.

While this method has been developed primarily for the exclusion of water occurring only a very few feet above an oil sand, it might be utilized for cementing all oil strings in order to obtain a better seal around the casing shoe—and possibly to exclude upper gas where the production of same is undesirable.

(Note): Extract from paper read before Fifth Mid-Year Meeting, A. P. I., Tulsa, Oklahoma, May 16, 1935. For full text see Oil Weekly of May 20, 1935.



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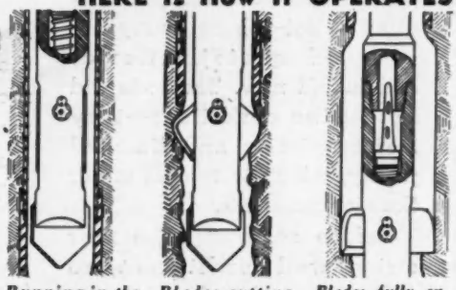

Running-in the hole with blades inside of body. *Blades cutting into formation as rotation starts.* *Blades fully expanded in cutting position.*

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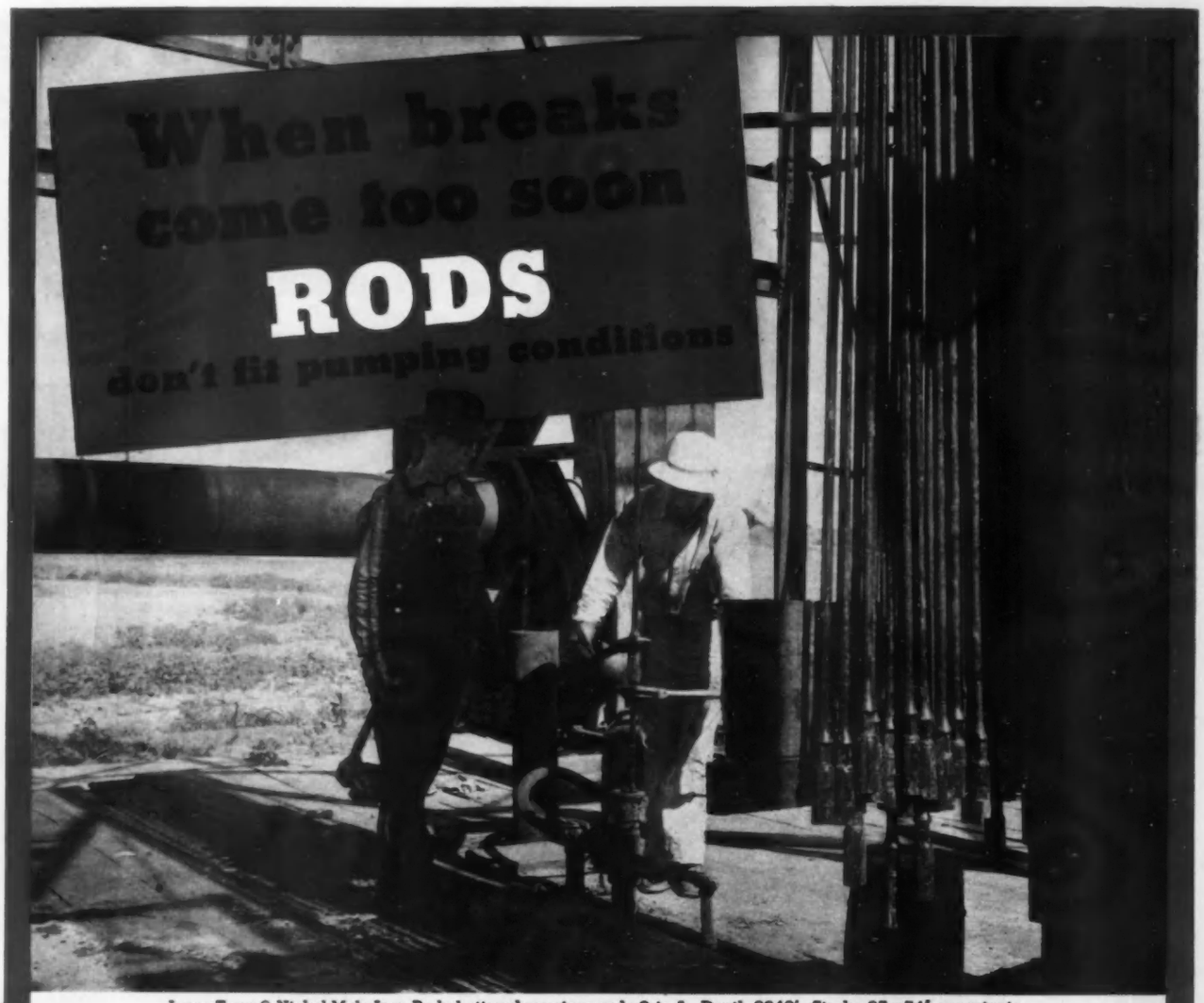

Jones Type 6 Nickel Moly Iron Rods bettered previous rods 2 to 1. Depth 3240'. Stroke 25—54" per minute. 2" Plunger. Weight 14,000 lbs. Well making hydrogen sulphide. Producing 270 bbls. oil—240 bbls. water.

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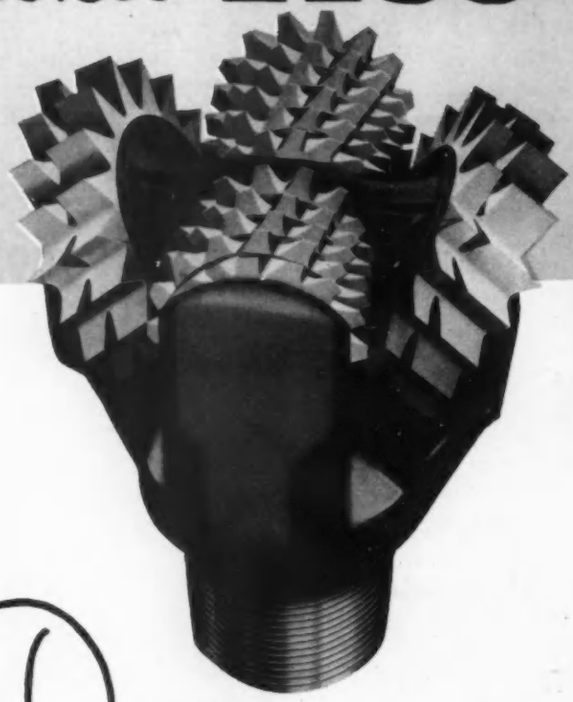

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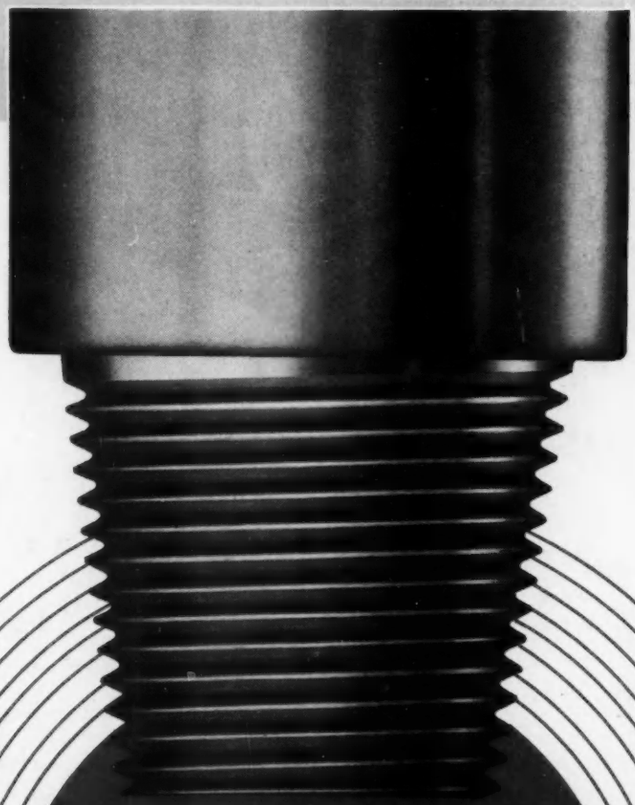

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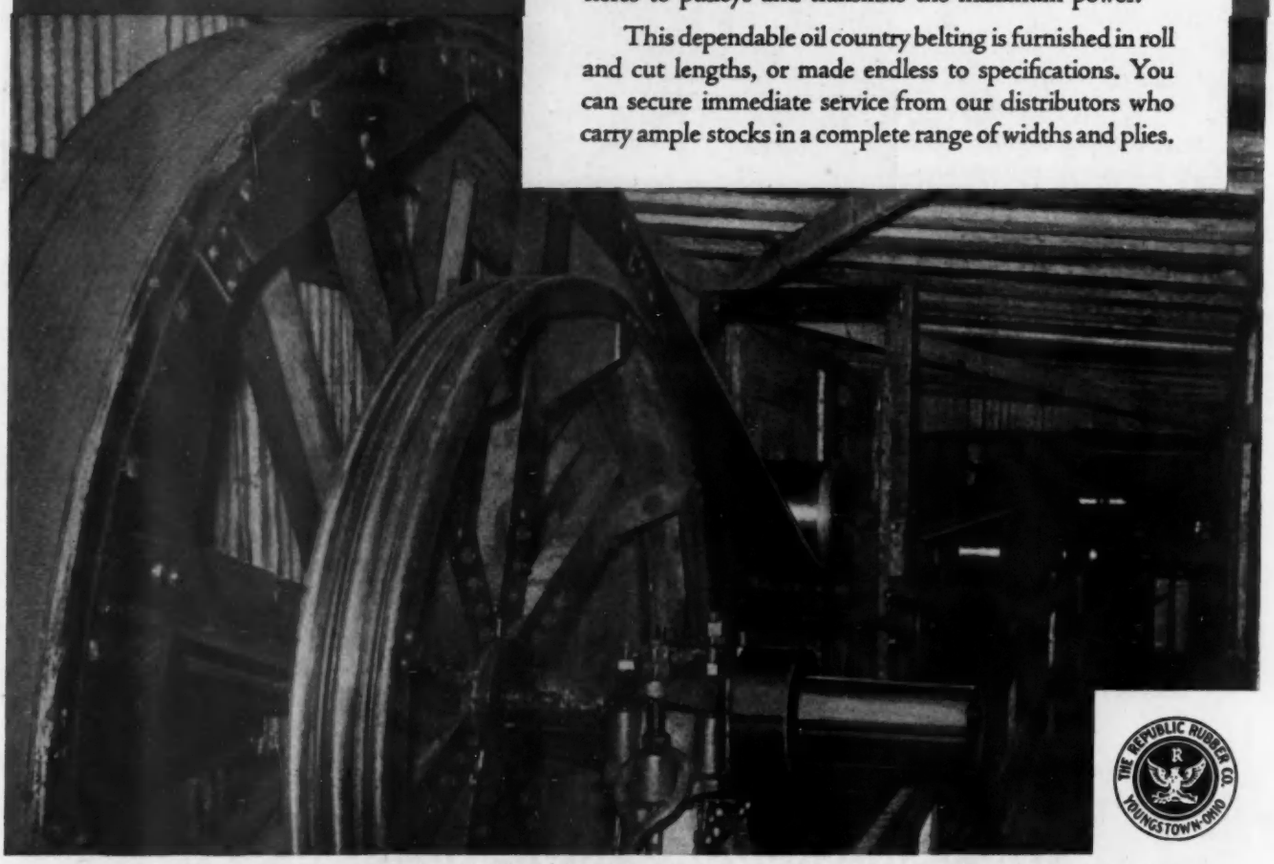

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THE OIL WEEKLY
FOR OIL AND GAS PRODUCERS AND PIPE LINE MEN
ENGINEERING • NEWS • STATISTICS

WARREN L. BAKER, Editor

. . . this Week

MID-YEAR statistics indisputably indicate the industry is in better circumstances than in pre-depression days. Domestic consumption is at an all-time peak, and as a result stocks of crude oil are materially below the amount stored in 1928, 1929 and 1930. With production under fairly effective control this situation is expected to continue to improve. In keeping with this favorable condition, drilling operations are definitely back to the levels attained in 1928, 1929 and 1930. Statistics presented in this issue show how the industry experienced the depression period, and how it now has recovered. **Page 13.**

APPARENTLY the next major oil field in the Permian Basin of West Texas is to be the Walton-Keystone structure of Winkler County, which has been highly touted, as evidenced by the unusual development of having 10 wildcats drilling before any oil was discovered. Last week one well was being completed and appeared good for 1000 barrels daily.

IT is anticipated that ultimately the total number of wells in the East Texas field will be more than 30,000. At present only 2000 wells are equipped with lifting equipment. Should the remaining 28,000 completed and to-be-completed wells go on the pump during the next six years, a total of 383 wells each month would be equipped at an expenditure of $1,149,000. This gives some idea of the immense proportions of the problem of equipping East Texas wells with lifting equipment, which topic is featured in this issue of THE OIL WEEKLY. A number of interesting engineering articles written by engineers familiar with the field are presented, which brings todate for the first time in comprehensive and authoritative form the latest status of the East Texas artificial production engineering problems since THE OIL WEEKLY's issue of July 17, 1933. **Page 29.**

THE industry now generally believes it is the duty of oil producing state legislatures to prevent, by adequate statutes, the waste of crude oil and reservoir energy, but there is nothing in the industry's nature that requires further government control. A number of suggested measures for permanent legislation have been under consideration, but in the end it likely will be recognized that it is to the best interest of all to travel as for as possible by voluntary self-regulation. W. R. Boyd, executive vice president of the American Petroleum Institute, made these remarks in summarizing the oil industry's position before the Mineral Section of the American Bar Association. **Page 20.**

HUMBLE Oil & Refining Company is operating a test rig in the Tomball field, and has been making a careful study of the effect of various rotating speeds, weights on bits, pump pressures, and torques on drilling progress. The company also is studying the relationship of various speeds to wear-and-tear on equipment. Considerable progress has been made, as evidenced by the recent drilling of a well in the Tomball field in 5½ days actual drilling time.

RUMORS have it that a shake-up of considerable proportions is to occur shortly in one of the large integrated companies. It is possible a new president may be elected. Interested parties are declared to have approached one prominent oil man on the proposition. Control of the company may also change, it is said.

SINCE 1919 the retail price of gasoline, minus tax, has been cut in half; but in the same period the average tax has jumped from one-half cent to above five cents per gallon. While gasoline tax has proved a wonderful revenue medium, however, there is a saturation point, and it appears to be close at hand. Gasoline and other taxes are among the important undesirable factors confronting the industry.

The Oil Man's Calendar

AUGUST

American Petroleum Equipment Suppliers Association.

19-24 American Chemical Society, San Francisco, California.

SEPTEMBER

18-20 National Petroleum Association, Atlantic City, New Jersey.

OCTOBER

10-12 A.I.M.E. Petroleum Division, Mid-Continent Section, Houston, Texas.

16-17 American Association of Petroleum Geologists, Mid Year Meeting, Mexico City, Mexico.

NOVEMBER

4-5 Independent Petroleum Association of America, Annual Meeting, Dallas, Texas.

11-14 American Petroleum Institute, Annual Meeting, Biltmore Hotel, Los Angeles.

P & C Men Resign

BUT COMMITTEE MEMBERS MAY SERVE NEW BOARDS

WASHINGTON.

DECISION of the Planning and Coordination Committee not to continue in existence as an advisory committee of the Interior Department was laid before Secretary Harold L. Ickes last week by Chairman J. D. Collett. Members of the committee, however, will willingly serve on any new committee which may be set up, he was told.

Continuation of the committee for this purpose was suggested last month by the secretary as an alternative to the appointment of a different committee.

To carry out the purposes of the amended recovery act, Ickes explained, he was continuing the Petroleum Administrative and the Petroleum Labor Policy Boards.

Ickes Regrets

"The Code of Fair Competition for the Petroleum Industry under which the Planning and Coordination Committee was authorized and appointed has ceased," he pointed out, "but it seems to me very wise that such a committee be continued in existence by the industry in order to advise with and aid the government in the administration of the present act. Should this not be done it would be necessary to appoint a committee from the industry for this purpose. As your committee has been in existence during the whole code period, I prefer that it continue rather than to set up a different committee."

Explaining that a majority of the replies received by the committee from those with whom it had conferred approved the plan of the appointment of the members of the Planning and Coordination Committee on a new advisory committee, Chairman Collett advised the secretary that "In deference to the views of some of the committee members and also of some of the other contributors to the funds raised for operating expenses of the original Planning and Coordination Committee, it is deemed advisable that the new committee, if appointed, should be set up as an entirely new committee with appropriate name and not as a continuation of the code committee.

"This will permit of liquidation of the affairs of the original Planning and Coordination Committee and plans can be made for such financial support as may be found necessary for the new committee, when the scope of its activities have been determined."

The Planning and Coordination Committee will go out of existence on July 20.

Decision of the Planning and Coordinating Committee to go out of existence was criticized by Wirt Franklin, president of the Independent Petroleum Association of America, as leaving the industry "Without a recognized and official representative group in Washington authorized to interpret the problems, aims and plans of the whole industry at the very time when uncertainty, lack of a definite program and the menace of crashing prices threatens."

Dissolution of the committee, Franklin declared, makes it of vital importance for the industry to provide effective representation, both majors and independents having the opportunity to develop their respective trade associations, if the industry is to be protected against the improper activities of various destructive elements and against the possibility of "improper federal control."

"Contributions toward reemployment and industrial restoration made by the petroleum industry under the past two years' program have been incalculable," he asserted. "The sustained price of oil and the approach to a balance between supply and demand in spite of chiselers, hot oilers and enforcement weaknesses, are most persuasive demonstrations of the value of cooperation between the industry and the government. That cooperation should not end with the passage of the code committee."

WAGNER SUIT LIKELY

Expect Supreme Court test of bill at early date

WASHINGTON.

SUPREME COURT determination of the constitutionality of the Wagner Labor Relations Act is foreseen in Washington as inevitable, as a result of the public announcement of several of the largest industries that they will ignore the measure.

While the oil industry has made no formal pronouncement of its stand, it is reported that few, if any, of the larger companies will accept the law without protest.

Bitterly assailed by business as ignoring its rights, as well as those of workers who did not belong to the union to which a majority in a plant might adhere, the act will be accepted only in the event that the Supreme Court holds it valid, it has been made clear by leaders in several industries.

The new law is generally considered as highly unconstitutional, and is declared to demonstrate the alleged policy of the administration of legislating without regard for the nation's basic law, with view to using adverse decisions of the Supreme Court to support its campaign for a rewriting of the constitution to make possible the socialization of the country at which it is charged the President aims.

President Roosevelt's ideas as to the course to be followed with respect to controversial legislation of this character were voiced earlier this month in a letter to Representative Hill of Washington, instructing him to bring the Guffey Coal Bill out of committee, whether it is constitutional or not, and let it take its chances in the courts.

"A decision by the Supreme Court relative to this measure would be helpful as indicating, with increasing clarity, the constitutional limits within which this government must operate," the President wrote.

Manifestly no one is in a position to give assurance that the proposed act will withstand constitutional tests, for the simple fact that you can get not 10 but a thousand differing legal opinions on the subject. But the situation is so urgent and the benefits of the legislation so evident that all doubts should be resolved in favor of the bill, leaving to the courts, in an orderly fashion, the ultimate question of constitutionality.

BIG PRESSURE DROP

East Texas shows seven pound drop during June

TYLER.

RESERVOIR pressure in the East Texas field sagged seven pounds during June, according to survey conducted by engineers on July 1. This drop places the weighted average for the field at 1206 pounds, and reflects the marked changes noted in recent months in the physical condition of the field regarding spread of bottomhole water and dissipation of flowing energy. Weighted average pressure for the field has sustained a steady decline since January 1, except during May, when engineers reported no change over the previous month. The decline for the six months period amounted to 25 pounds, with many areas registering a much greater slump. While the number of wells actually pumping and dependent upon gas and air lift devices for producing the allowable involve about 2000 units the number of non-flowing wells in the field have multiplied rapidly since the first of the year.

The commission has made little progress in its drive against dead wells being carried on production reports. With production taken from remaining flowing wells on a given lease, and also has failed to stop the widespread practice of swabbing. Unofficial reports on the number of non-flowing wells indicates that the total is sufficient to tax the production of the pumping equipment manufacturers output for more than six months. If the commission's ban against swabbing of wells could be enforced many operators have found that it is more economical to disregard the rules and pay commercial swabbing concerns five dollars per hour to swab wells once each month in producing the production quota for the period instead of installing pumping equipment and hiring field men to operate same.

An accurate survey of the water situation in the field is not available. Operators refuse to cooperate in the preparation of such a report for fear of being made party to pollution suits. Current figures credit the field with producing about 15,000 barrels of water daily, assuming all wells reporting are abiding by proration restrictions.

MID-YEAR STATISTICAL ANALYSIS

A basis for optimism: 1. Supply and demand are in balance; **2.** Drilling and production at pre-depression levels

THE OIL WEEKLY SEMI-ANNUAL REVIEW

Prepared by

JACK LOGAN, Associate Editor

I: DEMAND AND SUPPLY IN BALANCE

A Setting for Profits

IN some respects the petroleum industry is now on firmer ground and in better circumstances than in the halcyon days of 1928, 1929, and 1930. For example, the domestic demand for petroleum products has been running this year at all-time peak levels. Also, there is now substantially less stored oil to menace the markets than in 1928, 1929, and 1930, the stocks of all oils having been cut back during the depression to the proportions of eight years ago.

The stocks situation gives evidence of the remarkable success that has been achieved in balancing supply with demand. Production has been so rigidly curtailed as to result in large reductions of storage, in fulfilling the consumption requirements. That effective control of production has been maintained consistently for the past five years, and the restrictive program continues generally successful at present.

Thus the industry is in especially favorable circumstances with regard to both the demand and supply factors of its markets. The large demand means large volume of business. The successful restriction of supply is bringing, at last, favorable prices. The large volume of business at favorable prices means a proper setting for profits to oil companies. Thus there have been favorable earnings records, generally in 1935, especially in the second quarter of the year. (Depressed markets in California in recent months have marred the earnings records of companies operating in that region, but elsewhere, results have been favorable.)

The statistics on petroleum for this year bear out indisputably the statement that the industry's fundamental position is especially favorable. By comparing this year's figures with those of last year, there is found definite evidence of the industry's favorable circumstances. By carrying the comparison back through the depression and pre-depression years, there is obtained even more impressive proof that the basic conditions are good.

To bring out such a long-range comparison, the accompanying table has been prepared from the reports of the United States Bureau of Mines. The Bureau only recently issued its petroleum statistics for May and the first five months of the year. Consequently, figures for June and the first six months will not be available for several weeks. The five-months' statistics are sufficient, however, to show reasonably well the trends for the first half of the year. In the accompanying table, the figures cover the first five months for each year back through 1928. Thus an eight-year comparison is made.

Demand at All-Time Peak

Perhaps the most significant figures of the table are those on domestic demand. They show that in 1935 consumption of oil in the United States is exceeding all previous records. Even in 1934 the domestic demand was running close to the 1930 peak level, and this year a new all-time record is being established.

Since export requirements have been comparatively low this year, however, the total demand has not been quite equaling the records of 1929 and 1930. But the total demand is running higher this year than in 1931, 1932, 1933, and 1934.

Total demand for the first five months of the year was at an all-time peak of 444,195,000 barrels in 1930. During the depression the total demand dropped off about 15 percent, to a low mark of 374,823,000 barrels for the first five months of 1933. In both 1934 and 1935 lost ground was regained, this year's figures of 427,700,000 barrels for the first five months being back within 3.7 percent of the 1930 peak.

Export Business Dwindles

For the eight years here considered, export business, as well as total demand, was at peak proportions in 1930. During the first five months of that year exports of crude and refined oils totaled 66,424,000 barrels. Thereafter, the export demand contracted continuously until it was down to 40,022,000 barrels in the first five months of 1933, off nearly 40 percent from the 1930 record. In 1934 the five-months' figure rose to 46,112,000 barrels, but in 1935 it fell back to 43,086,000 barrels, which was less than 8 percent above the 1933 low record.

A significant circumstance in connec-

tion with export business has been the steady shrinkage of refined oil exports since 1930. The falling-off of refined oil exports has been even more pronounced than the sharp decline of total exports. For the exports of crude have been increasing, rather than declining. Thus crude oil exports have gradually increased from 6,794,000 barrels in the first five months of 1928 to 16,843,000 barrels in the five months of 1935, this year's figure being the peak for the eight-year period. But in the meantime, the exports of refined products have declined from 57,628,000 barrels in the first five months of 1928 to a new low mark of 26,243,000 barrels in 1935, this year's figure being less than one half as great as those for 1928, 1929, 1930, and 1931.

These statistics on exports reflect strikingly the nationalistic policies that have developed throughout the world in the past several years. Refineries have been built by countries to which the United States formerly sent substantial quantities of refined products. While such countries have increased their purchases of crude from the United States, they have cut down sharply on their purchases of refined products.

Domestic Use Sets New Record

The total domestic demand for petroleum products in the first five months of 1935 aggregated 384,614,000 barrels, and established an all-time peak for the period involved. That figure was 1.8 percent greater than the previous peak of 377,771,000 barrels in the first five months of 1930. After the 1930 record was set, the total domestic demand for petroleum products gradually declined 11.4 percent, to a depression minimum of 334,801,000 barrels for the first five months of 1933. In 1934 the total domestic demand recovered sharply, rising almost back to the 1930 peak. In 1935 the 1930 peak has been exceeded, establishing a new record.

Gasoline Demand Soars

Analysis of the domestic demand by products reveals that gasoline consumption has run a course similar to that for all products grouped together, except that the gasoline demand lost less ground during the depression, and has had a quicker and sharper recovery. So quickly did the gasoline demand recover that the depression low of 1933 was followed immediately by a new all-time peak in 1934, considering the first five months of each year. In 1935 there has been a further sharp gain in the gasoline consumption.

For the first five months of this year, the motor fuel demand aggregated 161,656,000 barrels. That represented a gain of 3.7 percent over the 155,868,000-barrel demand in 1934, and was 13.7 percent above the depression low mark of 142,224,000 barrels set in the first five months of 1933. Prior to the depression period, the peak domestic demand for motor fuel was 153,997,000 barrels in the first five months of 1930. That record was set following sharp gains in preceding years, the 1929 five-months' figure having been 140,808,000 barrels and that for 1928 having been only 120,244,000 barrels. From the old record of 1930, the gasoline consumption dropped off only about 8.5 percent in reaching the depression minimum in the fore part of 1933. In 1934 the depression loss was more than recovered, and in 1935 a new record in gasoline consumption is being set. The demand is running nearly 35 percent higher than in 1928.

By-Product Demands Up

As in the case of motor fuel, kerosene demand more than recovered depression losses as early as 1934, and has been running this year at new all-time peak levels. In 1928, 1929, and 1930, kerosene demand in the first five months was running a little over 15,000,000 barrels, and gradually increasing. From 15,797,000 barrels in the 1930 period, the demand dropped immediately to the depression minimum of 12,752,000 barrels in the corresponding 1931 period. From that low mark, the kerosene demand has steadily increased a total of 58 percent, having risen to 20,151,000 barrels for the first five months of 1935. The demand is running this year about 30 percent higher than in 1928, 1929, and 1930.

Although demand for lubricants has recovered materially from the depression bottom of 1933, the recovery has not been as pronounced as for gasoline and kerosene. In the first five months

[*Continued on page 102*]

Supply and Demand of All Oils

Taken from reports of the United States Bureau of Mines.

(In thousands of barrels of 42 U. S. gallons)

	1928 (First Five Months)	1929 (First Five Months)	1930 (First Five Months)	1931 (First Five Months)	1932 (First Five Months)	1933 (First Five Months)	1934 (First Five Months)	1935 (First Five Months)	Average for the Past Eight Years
New Supply:									
Domestic production:									
Crude petroleum	363,556	404,884	389,097	345,388	332,797	350,389	368,640	393,847	361,098
Daily average	2,391	2,682	2,577	2,287	2,189	2,320	2,441	2,608	2,437
Natural gasoline	17,171	20,650	22,183	19,786	15,869	13,640	14,671	15,602	17,447
Benzol	1,148	1,269	1,238	873	544	465	745	731	881
Total production	381,875	426,803	412,518	366,047	349,210	364,494	384,056	410,180	386,902
Daily average	2,512	2,827	2,732	2,424	2,297	2,414	2,543	2,716	2,558
Imports:									
Crude petroleum:									
Bonded warehouses	.....	.....	.....	.....	.....	.....	971	3,145	.....
For domestic use	.....	.....	.....	.....	.....	.....	13,127	9,409	.....
Total crude	31,638	37,261	25,363	21,531	24,375	14,119	14,098	12,554	22,617
Refined products:									
Bonded warehouses	.....	.....	.....	.....	.....	.....	4,516	4,943	.....
For domestic use	.....	.....	.....	.....	.....	.....	1,258	4,215	.....
Total refined	6,196	8,647	17,560	16,888	18,671	6,303	5,774	9,158	11,149
Total new supply, all oils	419,709	472,711	455,441	404,466	392,256	384,916	403,928	431,892	420,669
Daily average	2,761	3,131	3,016	2,679	2,581	2,549	2,675	2,860	2,782
Change in stock, all oils	+26,636	+41,558	+11,246	—9,795	+4,577	+10,093	—14,500	+4,192	+9,251
Demand:									
Total demand	393,073	431,153	444,195	414,261	387,679	374,823	418,428	427,700	411,414
Daily average	2,585	2,854	2,942	2,743	2,551	2,482	2,771	2,832	2,720
Exports:									
Crude petroleum	6,794	8,908	9,586	9,309	11,388	11,577	15,047	16,843	11,182
Refined products	57,628	53,584	56,838	52,526	36,636	28,445	31,065	26,243	42,871
Domestic demand:									
Motor fuel	120,244	140,808	153,997	153,277	143,053	142,224	155,868	161,656	146,391
Kerosene	15,026	15,465	15,797	12,752	14,583	15,835	19,493	20,151	16,138
Gas oil and fuel oil	.....	.....	.....	.....	.....	131,789	147,043	149,338	.....
Lubricants	9,447	9,691	9,445	8,965	7,449	6,117	7,977	8,192	8,410
Wax	.....	.....	.....	.....	.....	428	410	389	.....
Coke	.....	.....	.....	.....	.....	3,735	3,641	2,697	.....
Asphalt	.....	.....	.....	.....	.....	3,428	3,579	4,688	.....
Road oil	.....	.....	.....	.....	.....	819	1,659	1,195	.....
Still gas (production)	.....	.....	.....	.....	.....	17,275	17,252	19,655	.....
Miscellaneous	.....	.....	.....	.....	.....	570	736	925	.....
Losses and crude used as fuel	.....	.....	.....	.....	.....	12,561	14,658	15,728	.....
Total domestic demand	328,651	368,661	377,771	352,426	339,655	334,801	372,316	384,614	357,362
Daily average	2,162	2,441	2,502	2,334	2,235	2,217	2,466	2,547	2,363
Stocks:									
Crude petroleum	.....	.....	.....	398,972	368,039	343,588	355,883	338,559	.....
Natural gasoline	.....	.....	.....	4,029	4,270	3,966	4,420	5,977	.....
Refined products	.....	.....	.....	253,866	264,891	250,648	227,410	223,804	.....
Total, all oils	623,812	662,568	700,412	656,867	637,200	598,202	587,713	568,340	629,389
Days' supply	240	228	238	239	250	241	212	201	231

..... Date not available

2: DRILLING AND PRODUCTION

Back to Normal

DRILLING and crude oil production, two outstanding barometers of the oil industry's activity and welfare, are both definitely back to what might be called a "normal" basis. In fact, those barometers are back around "boom" levels, if 1928, 1929, and 1930 are looked upon in the usual manner as representing "boom" years.

For, in the opening half of 1935 both drilling and crude production have exceeded the volumes for the first six months of 1928, while this year's figures are following closely the patterns of 1929 and 1930. There was pronounced progress in 1934 out of the depression bottoms of 1931, 1932, and 1933, in both drilling and production. In 1935 the recovery has continued sharply. By now, consequently, the "normal" conditions for the industry have been virtually restored.

The Depression Course

Accompanying tables show how the industry experienced the depression period and how it subsequently has recovered. In the first half of 1929 both production and drilling were greater than for the similar period in 1928. By 1930, however, the first effects of the depression appeared, the first half of the year showing slight contraction of both production and drilling. In the first six months of 1931 the depression influences were bearing down heavily, and both production and drilling were curtailed sharply.

In the opening half of 1932 drilling was again at decidedly sub-normal levels, while crude oil production was contracted further, in reflection of declining demand. In the first half of 1933 crude production turned back upward, reflecting the fact that oil consumption had been cut to a depression minimum, and that the demand had entered upon a recovery. Meanwhile, however, there was a lagging of drilling, the first half of 1933 bringing the depression bottom in field work, as regards "first six months" statistics.

In the opening half of 1934, crude production showed a substantial increase, as demand continued to improve; and following its belated revival, drilling had recovered to a comparatively high level.

The first half of 1935 has brought further expansion of production, with consumption continuing to increase. Meanwhile, the comparatively heavy depletion of existing reserves has caused further expansion of drilling, in both proved and wildcat areas. At present, consequently, both crude production and drilling are back around the levels of 1929 and 1930.

It would be possible, of course, for increased drilling and production to represent undesirable rather than favorable circumstances. As regards drilling, such would be the case, for example, if numerous new, flush fields had been discovered. As regards production, an increase would not be favorable if the output were not in balance with consumption. But the present comparatively large volumes of drilling and production are not surrounded by such circumstances.

There have been comparatively few important new oil field discoveries for the past several years. Discoveries of new reserves have not been keeping pace, in fact, with the relatively heavy depletion of established reserves. Thus increased drilling is justifiable.

Similarly, increased crude oil production has been quite justified by existing circumstances. While the output has been expanding, it has been kept consistently in fair balance with consumption. Demand has had a recovery, and increased production consequently has been warranted. In fact, the restricting of supply has been so rigid that the supply has been consistently less than demand for about five years. This fact is proved by figures showing that stocks of stored oil have been drawn upon rather heavily in each of the past five years. Current production was being restricted below requirements, and to finish meeting the demand, oils were taken from storage.

While drilling and production have recovered to 1929-1930 proportions, with demand and other circumstances justifying such recovery, the prices for oils, from well to service station, also have registered substantial recovery. Crude prices have been comparatively favorable for two years. Prices of products at the refineries and at service stations continued depressed until the early part of this year. But subsequently they have improved materially. The tank car and service station prices now are back near the levels of late 1930, except in California, where difficulties lately have been experienced.

The financial records of oil companies have developed favorable trends, in consequence of the recovery factors above noted. Earnings have naturally shown recovery, with demand and prices for oils getting back around "normal." Profits have been possible, again, with the increased volumes of business and the better prices.

Drilling Comparatively High

During the first six months of 1935, United States drilling was 19.4 percent greater than in the similar period of 1934. The new drilling volume was the greatest for the first half of the year since 1930. It was almost as high as in 1930 and 1929, and exceeded the record for 1928.

There were 9625 wells completed in the opening half of 1935. Corresponding figures for preceding years included: 8059 completions in the first six months of 1934, 4818 in 1933, 6478 in 1932, 5888 in 1931, 10,418 in 1930, 10,438 in 1929, and 8918 in 1928. These totals of completions include oil wells, gas wells, and dry holes.

These six-months' figures also reflect rather closely the trend taken by drilling for the full years of the period considered. In all of 1934 United States completions totaled 17,508. In earlier years the totals included 11,700 in 1933; 14,290 in 1932; 11,716 in 1931; 19,848 in 1930; 23,463 in 1929; and 19,964 in 1928. While the first

Wells Completed in First Half of Year, for Past Eight Years
Figures include oil wells, gas wells, and dry holes.

First Half of:	Arkansas	California	[1]Eastern States	Kansas	Louisiana	Oklahoma	[2]Rocky Mountain States	[2]New Mexico	[1]Michigan	[1]Southeastern States	Texas	Total United States
1928	107	331	2,819	549	376	1,754	108	.....	.....	.....	2,874	8,918
1929	154	526	3,741	379	391	1,651	[3]	.....	.....	.....	3,596	10,438
1930	96	506	3,544	494	502	1,706	200	.....	.....	.....	3,370	10,418
1931	60	213	1,628	244	265	700	133	.....	.....	.....	2,645	5,888
1932	20	119	1,294	225	189	435	62	.....	.....	.....	4,134	6,478
1933	20	144	888	275	232	552	41	.....	.....	.....	2,666	4,818
1934	32	255	958	409	352	921	88	38	228	17	4,761	8,059
1935	84	464	1,136	604	352	1,057	80	136	191	8	5,513	9,625

[1]Michigan and Southeastern States included with Eastern States in years 1928-1933.
[2]New Mexico included with Rocky Mountain States in years 1928-1933.
[3]Information lacking.

Crude Oil Production in First Half of Year, for Past Eight Years
Figures are based on American Petroleum Institute Weekly Reports. They are in barrels of 42 U. S. gallons.

First Half of:	Arkansas	California	[1]Eastern States	Kansas	Louisiana	Oklahoma	[2]Rocky Mountain States	[2]New Mexico	[1]Michigan	[3]Southeastern States	Texas	Total United States
1928	16,422,150	113,365,200	19,569,000	19,934,750	11,418,650	115,632,450	14,392,850	.....	.....	.....	121,650,300	432,385,350
1929	13,382,050	141,054,450	20,251,050	19,041,870	10,208,600	121,432,370	12,989,830	.....	.....	.....	131,240,470	469,600,690
1930	10,100,000	118,403,000	24,918,000	21,246,000	10,787,000	116,601,000	13,961,000	.....	.....	.....	149,112,000	465,128,000
1931	8,434,000	95,652,000	19,608,000	19,041,000	11,867,000	99,298,000	17,441,000	.....	.....	.....	148,952,000	420,293,000
1932	6,224,550	91,267,400	22,136,650	17,855,040	10,997,775	77,871,200	15,290,810	.....	.....	.....	155,594,300	397,237,725
1933	5,573,950	84,407,535	19,148,200	19,649,950	12,096,700	78,302,250	13,506,400	.....	.....	.....	179,073,450	411,764,435
1934	5,645,150	86,406,522	17,722,300	26,052,500	14,041,900	89,392,550	7,421,200	7,975,850	5,201,300	.....	176,000,400	435,859,672
1935	5,608,550	91,259,947	19,080,400	26,376,200	22,325,100	90,228,550	8,953,500	8,897,400	6,808,500	.....	186,199,050	465,737,197

[1]Eastern States include Michigan in years 1928-1933.
[2]Rocky Mountain States include New Mexico in years 1928-1933.
[3]Only gas production.

half of 1935 has fallen under the corresponding period in 1930, the full year 1935 will quite likely show a gain over the full year 1930. For the latter half of 1930 witnessed a pronounced curtailment of drilling, while no such drilling decline is in prospect for the latter half of this year. Thus it is quite probable that 1935 completions will represent the greatest annual total in the whole eight year period, 1928-1935, with exception of 1929. The 1935 drilling probably will fall somewhat short of that in 1929, it is indicated.

More Drilling in Most States

The recovery in drilling in the past two years has been fairly uniform throughout the United States, although a few states have deviated considerably from the national trend. States which have registered drilling expansion in 1934 and again in 1935 have included Texas, Oklahoma, California, Kansas, and Louisiana, the five leaders in oil production, and also Arkansas, the Eastern States, and New Mexico. The Rocky Mountain States, Michigan, and the Southeastern States showed increased drilling in 1934, but have experienced declines in the first half of 1935.

Drilling expansion substantially greater than the national average has occurred in 1935, however, in New Mexico and Arkansas, while California also has had a noteworthy gain in drilling. Kansas drilling also has expanded in 1935 in proportions greater than the national average.

For the first half of the year, Texas has had more drilling in 1935 than in any other year back through 1928. The Texas drilling has been running about 65 percent greater this year than in 1929 and 1930, while it has been double the 1928 drilling. Kansas has also been doing more drilling this year than in 1928, 1929, and 1930.

The Rocky Mountain States, including New Mexico, have been furnishing about the same amount of drilling this year as in 1928, 1929, and 1930. Arkansas drilling has been nearly up to the 1930 level, but less than in 1929 and 1928. California's 1935 drilling record has not quite equaled those for 1930 and 1929, but it has surpassed that of 1928. Louisiana drilling in 1935 has not equaled that in 1930, but it has virtually recovered to 1928-1929 proportions. Oklahoma's 1935 drilling has been only about 65 percent as great as the volumes for 1928, 1929, and 1930. In the Eastern States, drilling has not revived materially from the depression "low" of 1933, only nominal gains having been made in 1934 and 1935. The drilling has been about the same in 1935 as in 1932, but this year's volume has been only about two-thirds that in 1931, and only around one-third as great as in 1928, 1929, and 1930.

Production on Upward Trend

United States crude oil production has been on an upward trend since the depression bottom was reached in 1932. For the first half of 1935, the output has been nearly seven percent greater than in 1934. The production in the 1935 first six months was 465,737,197 barrels, according to preliminary figures, based on the weekly reports of the American Petroleum Institute. In preceding years, the United States totals for the first six months were as follows: 435,859,672 barrels in 1934; 411,764,435 barrels in 1933; 397,237,725 barrels in 1932; 420,293,000 barrels in 1931; 465,128,000 barrels in 1930; 469,600,690 barrels in 1929; and 432,385,350 barrels in 1928. The output in the first half of 1935 has been, therefore, greater than in any other year for the past eight years, with exception of 1929, which had a slightly higher figure.

All states have had greater crude oil production in the first half of 1935 than in the similar period of 1934, with the one exception of Arkansas, which showed a slight decline. The most conspicuous increase was that for Louisiana, amounting to more than 50 percent. Flush, new fields in the coastal section of the state were responsible for the Louisiana increase. Material increases were also recorded for this year, over last year, for California, New Mexico, the Rocky Mountain States, and Michigan; while smaller gains occurred in Texas and the Eastern States. Kansas and Oklahoma, meanwhile, showed only slight production increases.

In comparing 1935 production figures with those for 1928, 1929, and 1930, it is found that important shifts have occurred as between states, although the total for the whole country has been about the same this year as in those pre-depression years. Texas output has increased greatly, as regards gains in terms of both percentage and actual quantity. Texas output in the first six months this year, for example, was 186,199,050 barrels, compared with 121,650,300 barrels in the corresponding period in 1928. The East Texas field has had an important role in causing this large gain. Louisiana production similarly has shown sharp expansion, the 22,325,100 barrels of the 1935 half-year comparing with around 11,000,000 barrels for the similar periods of 1928, 1929 and 1930. Michigan, Kansas and the Rocky Mountain states (including New Mexico) are also producing substantially more oil now than in the pre-depression years. On the other hand, there is substantially lower production now than in 1928, 1929, and 1930, in Arkansas, California, Oklahoma, and the Eastern States (exclusive of Michigan).

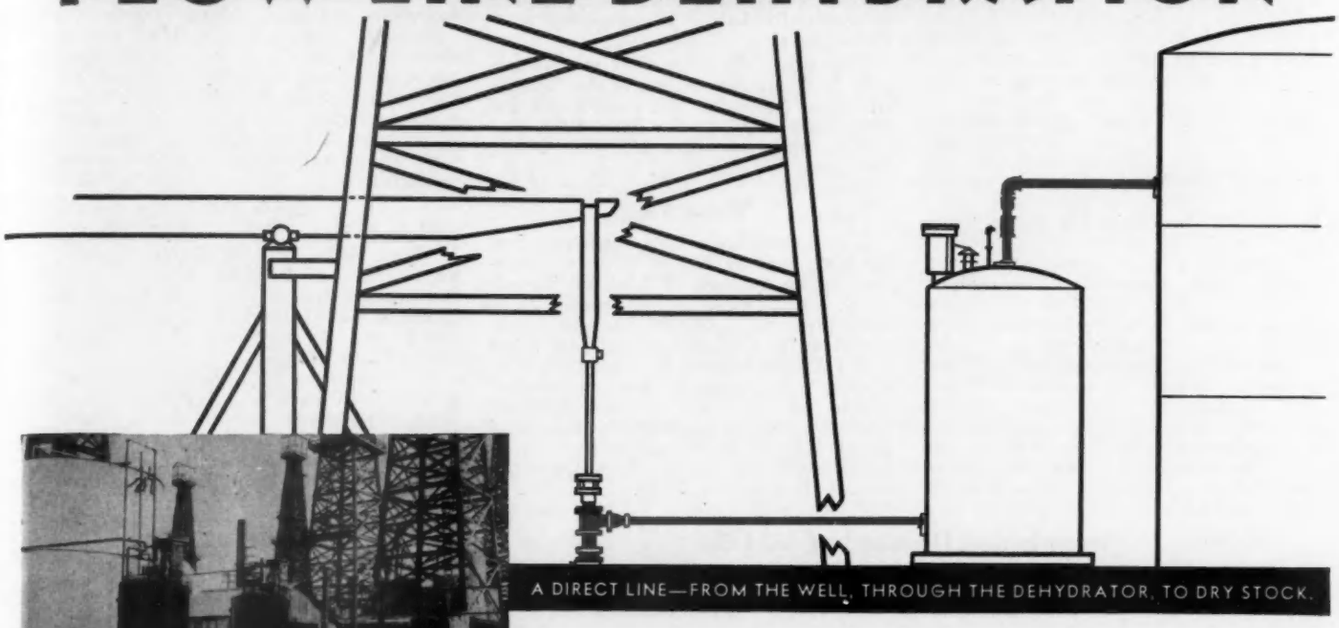
Texas and Louisiana Drilling and Production
By districts, first half of year, for past three years.

	1933		1934		1935	
DISTRICT	Wells Completed	Production	Wells Completed	Production	Wells Completed	Production
Texas:						
East	873	81,586,350	1,859	80,367,350	2,261	80,226,200
East Central	48	10,305,550	75	8,444,300	107	9,142,900
Panhandle	61	8,208,450	151	9,574,100	270	10,971,150
North	348	8,837,750	1,032	10,132,750	1,003	10,480,900
West Central	149	4,079,150	226	4,761,700	210	4,598,500
West	125	28,769,650	233	24,591,150	328	27,618,650
South	431	9,041,000	656	8,412,850	833	10,831,050
Gulf Coast	631	28,245,550	529	29,716,200	501	32,329,700
Total Texas	2,666	179,073,450	4,761	176,000,400	5,513	186,199,050
Louisiana:						
North	138	5,213,900	195	4,827,150	137	4,172,400
Gulf Coast	94	6,882,800	157	9,214,750	215	18,152,700
Total Louisiana	232	12,096,700	352	14,041,900	352	22,325,100

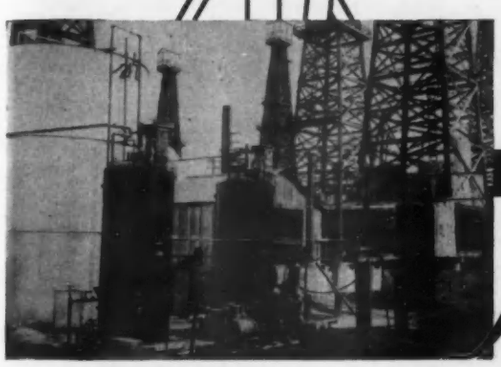
PETRECO

The Electrical Process for Dehydrating Crude Oil Emulsions

FLOW-LINE DEHYDRATION



A DIRECT LINE—FROM THE WELL, THROUGH THE DEHYDRATOR, TO DRY STOCK.



A Recent Development Of Importance To Producers

IN flow-line treatment, electrical dehydration of emulsified crudes has been developed to an unusually high state of perfection. This method of treating attains certain desirable results which previously have been impossible by any process or system. It is adapted to wells of practically all production capacities, and to a wide range of average and extremely difficult production characteristics. It offers many important advantages, and affects many direct and indirect economies, all of which accrue directly to the producer. We earnestly recommend that production executives investigate this advanced development in handling crude oil emulsions at once. Petreco engineers will supply complete information and operating data on request without obligation.

A comprehensive article on Flow-Line Treatment appears in the current issue of The Electric Dehydrator. If you have not received a copy, write your nearest Petreco representative, or direct to the general offices, for a copy.

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ANALYSIS OF BUREAU OF MINES FIGURES FOR THE MONTH SHOW

May Was Favorable

PRACTICALLY all statistics of the petroleum industry for May were favorable, it is indicated through analysis of the regular Bureau of Mines report for that month, lately released.

Crude oil production was substantially higher than in the previous month, but the higher output was justified by higher allowables and seasonal factors. The production was balanced sufficiently well with demand, in fact, to result in withdrawal of a million and a quarter barrels of crude from storage in meeting requirements. The withdrawals of crude from storage occurred, moreover, while refinery activity was sub-normal to the extent that a substantial part of products consumed came from storage.

Meanwhile, domestic demand for motor fuel was three percent above that in May last year, while exports of motor fuel exceeded expectations, having been greater than in either the previous month and May last year. Because of relatively high demand, motor fuel stocks were withdrawn more rapidly than anticipated, falling substantially below the accepted economic level.

The price situation also was favorable in May. According to the Bureau of Labor Statistics, the price index for petroleum products for May, 1935, was 52.2, compared with 51.0 for April, 1935, and 50.7 for May, 1934.

Motor Fuel

The domestic demand for motor fuel in May was 39,089,000 barrels, representing an average of 1,261,000 barrels daily. The exports of motor fuel amounted to 2,141,000 barrels, compared with 1,467,000 barrels in April and 1,907,000 barrels in May, 1934. The decline in finished and unfinished stocks of gasoline totaled 2,910,000 barrels. The drop brought the total as of May 31 to 61,483,000 barrels, or about 5,000,000 barrels less than the accepted economic level.

The yield of gasoline from crude increased to 44.3 percent in May, which was the highest since October, 1933, and 0.6 percent higher than in April, the latter gain being entirely due to increased cracking, as the straight run yield decreased 0.1 percent.

The first definite seasonal decline in fuel oil demand occurred in May. The daily average indicated domestic demand for kerosene declined to 114,000 barrels from 125,000 barrels in April, and the daily average domestic demand for all grades of gas oil and fuel oil decreased from 956,000 to 871,000 barrels in the same period.

Refinery data of the May report were compiled from refineries having aggregate daily recorded crude oil capacity of 3,685,000 barrels. Those plants operated during the month at 70 percent of their capacity, compared with an operating ratio of 68 percent in April.

Crude Oil

United States crude oil production in May, 1935, was 82,454,000 barrels, an average of 2,659,000 barrels daily, the report showed. That indicated an increase of 45,600 barrels daily over April and about 84,000 barrels over May of last year.

Production in California rose to almost 500,000 barrels daily, after having been abnormally low in April. Oklahoma output was slightly higher in May. The Louisiana Gulf Coast continued its steady gain. Kansas showed but little change. Texas rose 11,000 barrels over April, averaging 1,067,000 barrels daily. The Texas gain was accounted for by East Texas, the rest of the state remaining practically unchanged.

Crude runs to stills, averaging 2,594,000 barrels daily, showed greater increase than the gain in crude production. Consequently, crude stocks declined in May, after having increased in April and March. The net withdrawal from crude oil stocks in May was 1,234,000 barrels. At the end of the month, the total stocks of refinable oils was down to 338,559,000 barrels. Stocks in California declined to such an extent as to more than compensate an increase of stocks east of California.

Supply and Demand of All Oils

From Bureau of Mines Petroleum Report for May, 1935

(Thousands of barrels of 42 gallons)

	May, 1935	April, 1935	May, 1934	Jan.-May, 1935	Jan.-May, 1934
New Supply:					
Domestic production:					
Crude petroleum	82,454	78,427	79,870	393,847	368,640
Daily average	2,660	2,614	2,576	2,608	2,441
Natural gasoline	3,085	3,056	2,907	15,602	14,671
Benzol[1]	145	138	172	731	745
Total production	85,684	81,621	82,949	410,180	384,056
Daily average	2,764	2,721	2,676	2,716	2,543
Imports[2]:					
Crude petroleum:					
Bonded warehouses	474	629	110	3,145	971
For domestic use	2,959	1,970	2,902	9,409	13,127
Refined products:					
Bonded warehouses	1,075	1,114	1,079	4,943	4,516
For domestic use	566	737	365	4,215	1,258
Total new supply, all oils	90,758	86,071	87,405	431,892	403,928
Daily average	2,928	2,869	2,820	2,860	2,675
Decrease in stocks, all oils	—1,198	—1,291	—2,082	+4,192	—14,500
Demand:					
Total demand	91,956	87,362	89,487	427,700	418,428
Daily average	2,966	2,912	2,887	2,832	2,771
Exports:					
Crude petroleum	4,613	3,776	3,724	16,843	15,047
Refined products	5,133	4,305	5,915	26,243	31,065
Domestic demand:					
Motor fuel	39,089	36,076	38,141	161,656	155,868
Kerosene	3,545	3,751	3,222	20,151	19,493
Gas oil and fuel oil	27,010	28,685	26,744	149,338	147,043
Lubricants	1,919	1,802	1,941	8,192	7,977
Wax	93	88	78	389	410
Coke	531	406	524	2,697	3,641
Asphalt	1,531	1,244	1,285	4,688	3,579
Road oil	478	292	779	1,195	1,659
Still gas (production)	4,411	3,916	3,674	19,655	17,252
Miscellaneous	187	167	172	925	736
Losses and crude used as fuel	3,416	2,854	3,288	15,728	14,658
Total domestic demand	82,210	79,281	79,848	384,614	372,316
Daily average	2,652	2,643	2,576	2,547	2,466
Stocks:					
Crude petroleum	338,559	339,793	355,883	338,559	355,883
Natural gasoline	5,977	5,586	4,420	5,977	4,420
Refined products	223,804	224,159	227,410	223,804	227,410
Total, all oils	568,340	569,538	587,713	568,340	587,713
Days' supply	192	196	204	201	212

[1]From Coal Division. [2]Imports of crude as reported to Bureau of Mines; imports of refined products from Bureau of Foreign and Domestic Commerce.

ROAD OIL SALES

Gain in secondary roads boosts 1934 demand

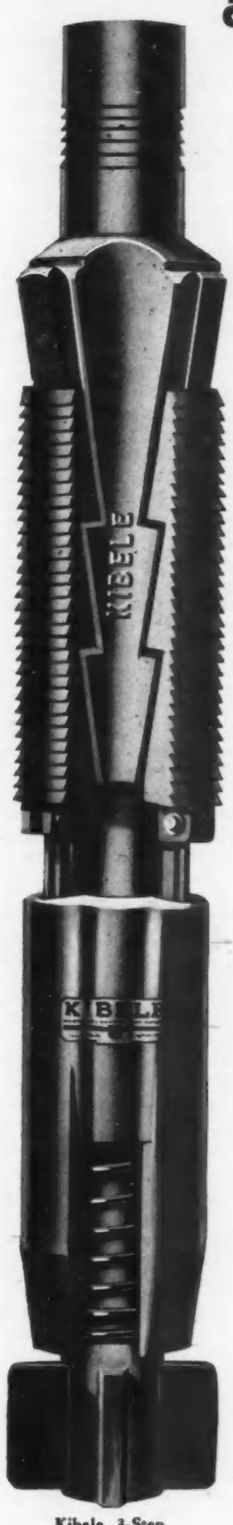
WASHINGTON.

SALES of road oil in the United States in 1934 were one-fifth greater than in 1933, according to a report of the Bureau of Mines. The prices received were also better, the average value at refineries having been $1.39 a barrel in 1934, compared with $1.01 in 1933.

The greater demand was attributed to increased construction of secondary and farm to market roads, especially west of the Mississippi River, financed largely by federal funds.

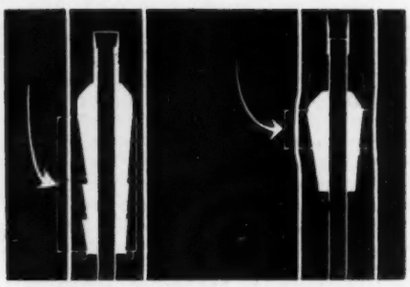
Sales of road oil by petroleum refineries in the United States increased in 1934 to 7,702,753 barrels, valued at $10,741,998, from 1933's record of 6,238,898 barrels, valued at $6,289,119.

Announcing the KIBELE Two-Step and Three-Step TUBING CATCHERS



Kibele 3-Step Tubing Catcher

An Answer to the Industry's Demand for Greater Protection Against Falling Tubing, Wedged Catchers and Ruined Casing.



Long Slips Protect Casing — Short Slips Rupture Casing

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1. **It has two to three times the Slip Area of any other Catcher without complicating the structure, restricting fluid passages or being forced away from the most effective wedging angle.**
2. **It prevents the rupture of casing walls commonly resulting from short slips applying too much stress upon restricted areas.**
3. **It has a stream-lined design and ample, unrestricted by-pass area.**
4. **It can be lowered into a well rapidly.**
5. **It is of rugged construction.**
6. **It releases easily after catching tubing.**
7. **It is furnished complete with anchor.**
8. **It is made with two-step slips for wells less than 4,000 feet deep; it is made with three-step slips for wells below 4,000 feet.**

This new TUBING CATCHER, along with KIBELE PISTONS and SWABS, is on sale at oil field supply stores. But if you would like further details, send for our bulletin.

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Business Control

VOLUNTARY SELF-REGULATED ROUTE IS OF BEST INTEREST

By W. R. BOYD, JR., Executive Vice President, American Petroleum Institute

CONFLICT between operations under the "law of capture" and orderly economic procedure has had such dire economic consequences as to establish the necessity of maintaining by regulation and voluntary action wherever possible some semblance of order in the production of oil so that the relatively few might not destroy economically the large body of operators. For years the industry has encouraged voluntary action by producers to prevent waste of gas energy, to increase ultimate recovery of oil and to restrain output to reasonable current consumer requirements. At times situations have developed beyond the power of the industry to remedy.

Until the conservation laws and efforts of the states became effective, the "law of capture" worked unchecked and unhampered and resulted in unscientific and wasteful practices and overproduction. Now, both the industry and the legislatures of most of the oil producing states have come to an intelligent conception of what real conservation means. The petroleum industry in general now is convinced that conservation and good business practice means the scientific control of production, making for greater recovery as well as efficient and economic utilization of crude oil. I think that the industry generally now believes it to be the duty of the legislatures of oil producing states, in the public interest as well as in the interest of the industry itself, to prevent, by adequate statutes, the waste of crude oil and reservoir energy and thereby to conserve the supply and increase the recovery. All, I think, believe that this duty is the obligation of government, but I am even more certain that none believes that when that obligation shall have been discharged, there is anything in the inherent nature of the business of producing, refining or marketing petroleum and its products which requires further government control. There is no more justification for the oil industry to be declared a public utility than for the producer, manufacturer or marketer of any other commodity in general use.

A number of suggested measures for permanent legislation have been under consideration. First, the determination by some agency of the federal government of the required production of oil by a fact-finding agency; second, the adjustment of production to accord with that determination; and, third, the regulation of commerce, that is, of importations and of interstate movements. There is general agreement within the industry that the regulation of imports and of the movement in interstate commerce of oil produced in violation of state laws is a federal responsibility. Beyond that there is disagreement.

THE accompanying article is an abstract from a speech made by Mr. Boyd before the Mineral Section of the American Bar Association, 58th Annual Meeting, Los Angeles, July 15.

One group holds that the determination of demand, the allocation and restriction of production and the regulations of commerce should be performed by the federal government. The other asserts that there is neither need nor constitutional authority for regulation or interference by the federal government other than to control imports and extend permanently its authority over the movement in interstate commerce of unlawfully produced oil. Both groups, however, are agreed upon the desirability of ratification by the Congress of the Interstate Oil Compact, initiated by Governor Marland, of Oklahoma, and to date entered into by five of the oil producing states. Also, there is fairly general recognition that the law of capture is an artificial factor which, unless restricted under the police power of the respective oil-producing states, forces production into markets in response to the rate of offset drilling rather than the demand for oil.

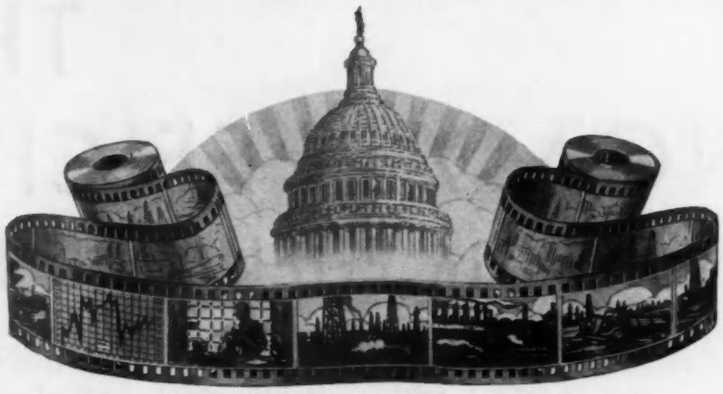
If it were not for the devastating severity of the federal and some of the state anti-trust laws, the problem of self-regulation for an industry like ours would not be so difficult. Law is supposed to be but the essence of common sense. If federal and state governments are to exercise power to negative business agreements detrimental to the public interest they should likewise affirmatively permit, under appropriate supervision, agreements that are clearly in the public interest. The sweeping provisions of our anti-trust laws make some practices unlawful that are clearly in the public interest. It is senseless to prohibit all restraint on competition whether this restraint be reasonable or unreasonable. The government should not interfere with private business any more than is essential to protect the public interest from abuse. When property rights are adequately protected, when competitive channels are kept free and open on equal terms to all alike, the duty of government ends. The alternative is either government-regulated monopoly or government ownership.

Price wars will come and demonstrate their devastating effect. None is ever profitable. Neither by government fiat or industrial arrangement can the fact be altered that prices for petroleum and the products thereof will be fixed with mathematical certainty and precision by the law of supply and demand.

What we need, if anything, in government is orderly development; what we need in industry is sane readjustments founded upon efficiency, not nationalization with all its political repercussions on the economic order. Unless we destroy individual initiative and the system where price and profit control, we must have competition, not monopoly or government operation. Business success founded upon honor, integrity and courage should be commended and encouraged, not despised and destroyed.

The complexities of our industry make the problem of securing a healthy, self-respecting and mutually sympathetic attitude between those engaged in its different branches indeed a difficult one, but in time there will come full realization that industrially they are partners, not enemies, for men can be commercial competitors without being commercial enemies. Such a course will inevitably involve the surrender or postponement of special and private interest and the abandonment here and there of local advantage, but compensation will be found in the assurance that stability will prevail and that in the long run not only the general but the individual welfare will be advanced. After all, the petroleum industry, as a whole, must go up or down as a unit, and I confidently expect that despite all existing differences as to methods of procedure, we will all in due time unite in arriving at the conclusion that it will be in the best interest of all concerned to travel as far as we can the voluntary self-regulated route.

The Changing Panorama



THE OIL WEEKLY'S COMPOSITE VIEW OF INDUSTRY

Edited by JACK LOGAN, Associate Editor

SO FAR as the oil industry is concerned, it is quite safe to refer to the depression in the past tense. For the industry already has recovered nearly all ground lost during the slump. Along some sectors it has not stopped with regaining lost ground, having pushed ahead and gained positions better than those formerly held.

Thus any reverses that may be in store would be more in the nature of a new depression, rather than a continuation of the old.

Some Pre-Depression Conditions Excelled

Sectors in which the industry now occupies better positions than before the depression include, particularly, that embracing domestic oil consumption and that involving oils in storage. The domestic consumption of oils is running this year at all-time record levels, with gasoline and kerosene demand especially strong. The oils in storage do not bulk nearly as heavily as at the culmination of the pre-depression boom, and thus the stocks do not menace the markets as much. With domestic production and imports held consistently below demand, the storage has been cut down greatly in the past five years, the stocks being as low now as in June, 1927.

Other Boom Conditions Almost Equalled

While the demand and storage situations are thus better than before the depression, there are various other conditions which have recovered almost to the pre-depression state. For instance, petroleum product prices, wholesale and retail, have recovered to levels as high as in the latter part of 1930. Meanwhile crude oil prices are similarly improved, having risen back to levels that compare favorably with those of 1928, 1929, and 1930. Moreover, there is continued success, generally, in balancing new supply of oils with demand, promising maintenance or improvement of prices.

By reason of increased demand for oils and the successful balancing of supply with the requirements, the oil companies are doing near-record volumes of business, at favorable prices. Consequently, they are showing, generally, this year, the highest earnings since 1930.

In keeping pace with the rising demand, crude oil production has been boosted upward, after having been cut back during the depression; and refinery and marketing operations have similarly recovered. And in line with the higher production, as well as better prices, drilling has been expanded sharply. The drilling is running this year at levels that compare closely with those of 1928, 1929, and 1930.

Current Prices Comparatively High

The market situation showed some improvement last week, after having been disturbed considerably the week before. The present state of market affairs, consequently, is comparatively favorable.

Outside of California, crude prices are reasonably firm around the relatively high levels that have prevailed for two years. Meanwhile, product prices, wholesale and retail, are also fairly firm, at levels that are the best of the year and the highest since late 1930. At Mid-Continent refineries, gasoline tank car prices last week were generally one-eighth cent per gallon higher than in the preceding three weeks, having recovered to the 1935 peak levels originally established in late May and early June. These refinery prices tend to make crude oil postings secure at established levels. They serve to dispel the anxiety that arose at the close of June, when local crude price cutting of minor proportions occurred in Pennsylvania and in South Texas. The reductions in those areas represented localized market adjustments, and did not reflect any general market weakness.

Hope in California

In California the markets continue unstable. But last week there was hope of some improvement, based on the fact crude production control was proving somewhat more effective in the first half of July than in the similar period of June. So far, the California crude price structure has weathered the storm that has followed the lapse of the NRA, oil code,

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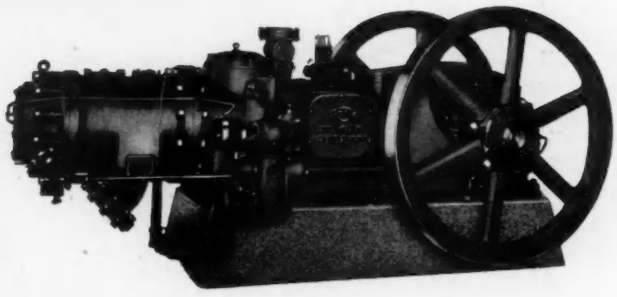

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and Pacific Coast marketing program. Voluntary proration, set up in lieu of the code control, proved alarmingly inadequate at first, but subsequently has become more effective. Product prices, wholesale and retail, are depressed, especially in Southern California. But there is hope that the crude production control will tighten sufficiently to strengthen the product prices.

Uncertainties Generated at Washington

The oil business, like industry in general, still faces at least a month or more of uncertainties from the political standpoint. Congress will continue in session that long, apparently, and it will take action on various pieces of legislation that would affect the petroleum industry.

Enacted and signed into law lately were: (1) the resolution extending for two more years the nuisance taxes, including the one-cent federal tax on gasoline; (2) the Wagner labor disputes bill, continuing the collective bargaining of NIRA.

Passed by both houses, but not yet out of conference between House and Senate is the social security legislation. Debated there, with outcome conjectural is the Senate amendment to permit continuance of existing private annuity plans which measure up to standards of the governmental tax-supported plan. "Bureaucrats" are fighting with determination to put the bill over sans amendment. Many industrialists are similarly determined to have the measure modified—perhaps for a double reason. In the first place, the amendment would save the private plans and be a brake on the movement toward bureaucracy. In the second place, the amendment might prove unconstitutional, because of granting exceptions, and thus lead to voiding of the whole act.

Still pending in Congress in early stages are these proposals that would affect the oil industry: (1) The Thomas bill, for controlling oil production (indirectly) and imports; and (2) the Presidential tax proposal, contemplating higher levies on inheritances and large incomes of individuals and corporations.

Chances of Federal Control

There appears to be but small likelihood that the Thomas bill, or any similar measure, will be passed. Heretofore, there has been strong opposition to such federal control from all classes in the oil industry, as well as from political leaders in oil producing states.

From the ranks of California independents, however, there came a prediction recently that major companies may switch to a position of neutrality or of active support of some such legislation. The prediction was based on the following reasoning: The big companies cherish workable proration, after all, and may have to turn to federal control to get results, for NRA's demise leaves California without air-tight proration; the interstate compact cannot be successful, in absence of California's support; and even the Connally act, barring interstate hot oil shipping, will be effective only until July 16 1937.

Despite California's predictions, however, it is difficult to see how the federal control proposal has much chance of adoption at this session. In the first place, little if any time will be available for considering it, with various important "must" bills yet to be disposed of. In the second place, there would still remain strong and bitter opposition to the federal oil control, even if the large companies should experience a change of heart. In the third place, the big concerns fear federal domination about as much as they like proration; consequently, it does not seem quite logical that they should sanction or espouse the federal control contemplated.

The Heavier Tax Burden

Possibly offering the greatest cause for concern for the oil business, as well as other industries, in connection with governmental affairs, is the matter of taxation. With government spending as it has been, is, and will be, heavy taxing is inevitable. Consequently, oil companies have before them the prospect of having to hand over greater sums to the tax collectors.

The larger companies and those run with unusual efficiency would be the first to feel the heavier tax load, if the President's new tax proposal is adopted by Congress in the suggested form. Instead of the present flat rate for all, the new plan would provide for a graduated tax scale, depending strictly on amount of income, regardless of capitalization. Companies with small incomes would pay rates slightly lower than at present; companies with larger incomes, higher rates than now. The scale would penalize not only a big company, because of its bigness, but also a small company, if it happened to be unusually efficient. It would coddle not only a small company, because of its smallness, but also a big company, if it happened to be inefficient.

Oil Company Discusses Taxes

In defense of the larger industrial enterprises, which would be penalized, particularly, by taxing of the nature just discussed, the Standard Oil Company (New Jersey) has published a pertinent article in its house organ, The Lamp. It was brought out that the article was presented because there is a well defined movement to penalize big industrial units to the point of not only preventing further growth but breaking down existing corporate structures.

"The successful big business is a great stabilizing force in times of depression," it was stated. And "By and large, it has never made as large profits on its capital as its smaller competitors." The assertions were made that: "There is room in the United States for this type of business and a need for it. There is likewise ample room for smaller companies, and both should thrive if they are not crushed by taxation."

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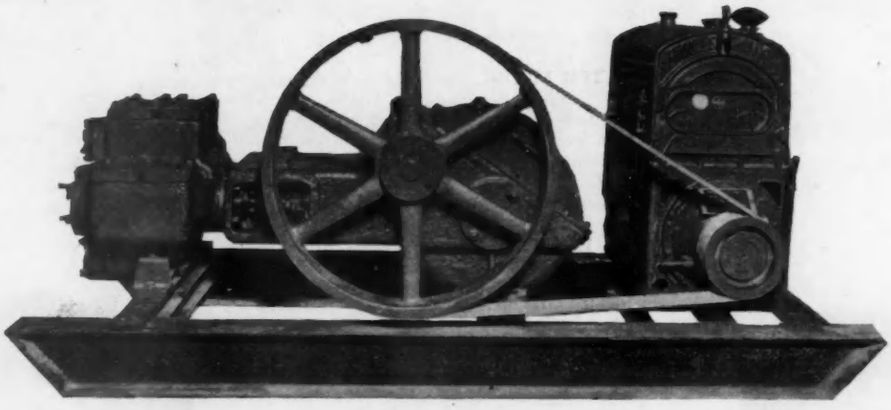

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MEN IN THE INDUSTRY'S NEWS

KENNETH E. BEALL IS ACTIVE IN PROMOTING UNITIZATION

RECENTLY HE ASSISTED IN DRAFTING PLANS FOR SOUTH BURBANK POOL

KENNETH E. BEALL

KENNETH E. BEALL, superintendent of the economics department of Phillips Petroleum Company, is one of several engineers who assisted materially in putting over unitization of the South Burbank pool of Osage County, Oklahoma. His time was devoted principally to the evaluation of properties as a basis in proportioning percentages of the unit to the various owners. Beall was graduated from Purdue University and immediately after graduation in 1919 was employed as a junior engineer by Empire Oil and Refining Company. In the following year he joined the production department of Phillips Petroleum Company. Later he was transferred to the economics department, which he now heads.

HARVEY W. GILBERT, president of Gilbert Oil Company, Beaumont, Texas, has returned from an inspection trip of the East Texas field and that vicinity.

T. J. MOORE, formerly with Simms Oil Company, has become an independent operator. He will continue to maintain his home in Dallas. Mr. Moore, during the past 12 years, has served as scout, land man and general utility man for Simms Oil Company in the Mid-Continent, during which time he covered practically every oil field in Texas, Oklahoma, Louisiana and Arkansas.

WALTER MEIER, chief engineer, Atlantic Oil Producing Company, Dallas, was a business visitor in Houston during the past week. Mr. Meier has just returned from a three weeks tour of California oil fields, in which he was investigating prime movers for pumping wells.

L. C. DECIUS, chief geologist for Associated Oil Company, with headquarters at San Francisco, has returned to California after a business trip to Houston.

J. HOWARD MARSHALL, who has been with the Petroleum Administrative Board since its organization, has resigned to engage in private law practice.

M. ALBERTSON, research engineer for Shell Petroleum Corporation, Houston, spent several days in the East Texas oil field during the past week.

WALTER B. PYRON, executive vice president of Gulf Companies, and Mrs. Pyron have returned to his headquarters in Houston after visiting in Mineral Wells, Texas.

GEORGE PIRTLE of Hudnall & Pirtle, consulting geologists and engineers, Tyler, Texas, has been called back to his headquarters from Mt. Pleasant, Michigan, for business reasons. Mr. Pirtle arrived in Mt. Pleasant June 25, and planned to spend several months studying geological conditions in the Michigan fields. It is thought he will soon return to Mt. Pleasant from Tyler.

DR. H. V. HOWE, head of the geological department of Louisiana State University, Baton Rouge, was the speaker at the Houston Geological Society's night meeting July 11. He discussed: "The Ostracods of the Type Choctawhakchee Miocene of Florida."

O. D. "Don" CRITES, assistant crude oil representative for Shell Petroleum Corporation, Houston, is vacationing in Dallas, Texas, and is expected to return to Houston the coming week.

JOHN D. ROCKEFELLER, SR., on July 8 enjoyed his 96th birthday, which marked the eightieth year since the start of his business career that carried Mr. Rockefeller from an assistant bookkeeper to the possession of estimated billions, made in the oil industry. At 96 he is long retired from business.

A. L. JACKSON, chief draftsman for Superior Oil Producing Company, Houston, is spending two weeks vacation in Kerrville, Texas.

PAUL R. MILLS, independent operator of Houston, is on a business trip to Chicago and Minneapolis.

DR. HERMANN SUIDA KNOWN AS AUSTRIAN "COLONEL DRAKE"

HAS BEEN RE-ELECTED PRESIDENT OF AUSTRIAN PETROLEUM INSTITUTE

DR. HERMANN SUIDA

PROMINENT among oil men in Austria is Dr. Hermann Suida of Vienna, who recently was re-elected president of the Austrian Petroleum Institute. Dr. Suida is a doctor of technical science, doctor of philosophy, professor of the Polytechnical high school in Vienna, and chairman of the Institute for Chemical Technology of Organic Substances. In 1913 Dr. Suida was a lecturer for organic chemistry at the Polytechnical high school in Bruenn; in 1918 he became a lecturer for organic chemistry and chemical technology of organic substances at the Polytechnical high school in Vienna. During the years 1911-1912 and 1914-1918 Dr. Suida worked as an assistant to Prof. Wegscheider at the First Chemical University Institute. During 1912-1913 he was occupied as an assistant to Privy Councillor I. M. Eeder at the Graphic Instruction and Research Institute for Chemistry and Photography. He served in the Austrian army from 1907 to 1919. From 1919-1921 Dr. Suida was a chemist in the works of A. G. Farbenindustrie A. G. in Uedringen on the Rhine. He also worked as foreign collaborator and consulting expert to A. G. Farbenindustrie

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HOUSTON - DALLAS - KILGORE - PAMPA - TULSA - OKLA. CITY - McPHERSON - HUTCHINSON
CHASE - RUSSELL - AND OTHER ACTIVE MID-CONTINENT AND GULF COAST POINTS

from 1917-1919 and from 1921-1935. From 1922 to 1934 Dr. Suida was a consulting expert and collaborator for Bosnian Wood Charring Company of Yugoslavia. In 1922 he was appointed professor of Technology of Organic Substances at the Vienna Polytechnical high school where he became dean of the faculty for technical chemistry. In 1932 came his election to the presidency of the Austrian Petroleum Institute and to membership in the Austrian Patent Court. He is the author of numerous scientific works.

LEON G. VORHEES, Oklahoma City, was elected president of the Cromwell-Franklin Oil Company in a recent meeting of the stockholders. Wirt Franklin is vice president and general manager, Charles Van Vleck is secretary and George E. Strauss is treasurer. The board of directors includes Vorhees, Franklin, Strauss, A. R. Hickman and P. J. Carey.

KENNETH COVELL, production engineer in the Chicago offices of Pure Oil Company, arrived in Tulsa early in the week and will spend about two weeks looking over company properties in the Mid-Continent areas. Covell formerly was chief petroleum engineer for Indian Territory Illuminating Oil Company at Bartlesville and was active in technical society affairs in the Mid-Continent.

R. L. McCULLOUGH is the geologist and Paul Harper the scout in Empire Oil & Refining Company's newly created western Kansas district with headquarters in Great Bend.

CHET McGUIRE has been transferred from the Seminole-Ada district to the Oklahoma City district of the scouting department of Carter Oil Company.

W. G. LANE, of Lane-Wells Company, Los Angeles and Houston, and J. C. Karcher, of Geophysical Service, Inc., Dallas, will be the principal speakers at the regular monthly meeting of the San Antonio Geological Society at the San Antonio Petroleum Club July 15. Mr. Lane will discuss the application of gun perforating methods to well completion, while Mr. Karcher will describe the use of electric resistance methods of formation study.

ED DOYLE, formerly deputy conservation officer in the Seminole district, is now in charge of proration matters for Gulf Production Company of Oklahoma with headquarters in Oklahoma City. Doyle was stationed in the Tulsa proration office for a short time before going to Seminole.

K. K. LANDES, asssitant state geologist in Kansas, is making a survey of Barber County. Landes has made liberal contributions to the study of Kansas geology and is author of a number of bulletins dealing with the geology of various counties and districts.

HAROLD B. FELL, executive vice president of the National Stripper Well Association, and of the Independent Petroleum Association of America, left Tulsa on July 3 and will return about the twenty-fourth after making official visits in Michigan, Pennsylvania and New Mexico.

File Spacing Suits

EAST TEXAS OPERATORS FACE SERIOUS PROBLEMS AS RESULT

TYLER.

OWNERS of densely drilled leases in the East Texas field are becoming panicky, and the banks, supply concerns and drilling contractors that supply the money, or labor and equipment, that has made many of the non-essential wells in the field possible are likewise in a quandary. Their collective fears are based on the firm stand taken June 9 by the Texas Supreme Court in upholding the Texas Railroad Commission's Rule 37 (well spacing restrictions) and also making it mandatory that the commission change its method of apportioning crude production between wells so as to give proper recognition to the approximate oil in place under each separate lease.

Guided by the Supreme Court decision, several major companies have launched a series of suits in Travis County district court to force the Railroad Commission to order specific wells plugged for allegedly having been drilled in violation of Rule 37, as interpreted by the state's highest court. This move jeopardizes the life of the completed wells under court attack, and the burden of defense largely rests upon the owner of the challenged well, as the commission has nothing at stake in a case of this kind.

Legal authorities versed on proration laws of Texas contend that the commission has no alternative when the Supreme Court ordered the change in method of distributing proration quotas between leases in the East Texas field. The structure has been explored on a basis of uniform percentage of the rated hourly flow of each well since April 24, 1933, starting at 15 percent and now based on 3.3 percent of the rated hourly potential. This method provides ample inducement for excessive drilling of given leases held by such operators that disregard the economic hazard of over-drilling the field.

General supposition is that the Railroad Commission will defer as long as possible, then only under the threat of court action, the change in proration method ordered by the Supreme Court. Proration leaders predict that the commission will then apportion production on a basis of rated potential times the number of acres in each lease, thus placing a heavy penalty on the owners of the many small tracts that have multiple wells.

May Bring Disobedience

This impending loss in revenue by the owners of leases having a high-well density is quite likely to bring on another period of disobedience to proration regulations of the state. The physical condition of the field, regarding the presence of bottom-hole water and dearth of flowing energy already prevalent over a sizeable portion of the structure, will not withstand a fresh outbreak of unrestrained production. The majority of the 18,100 wells would cease flowing within a week, according to qualified observers, and pumping equipment is not obtainable at any price to meet the demand short of several months in the event the operators break ranks as they have seen fit to do in past years when the commission attempted to apply restrictions that were not popular with the rank and file of the participants.

Many properties in the giant field have changed hands within the past two years involving considerations that will require the purchaser from three to 10 years to retire capital costs. Numerous wells have been drilled, with banks, professional money lenders, supply concerns and drilling contractors financing the projects, for oil payments strung out over similar periods. Average cost of a completed well is now close to $10,500 fully equipped with new casing, but many well owners have made contracts to pay up to $25,000 for an additional well, payable from 7/16 of the net production from the well drilled under this arrangement. Installation of pumping equipment has likewise been financed. Properties subject to production penalties under the terms of the Supreme Court ruling will be deprived of this source of financing in the fture.

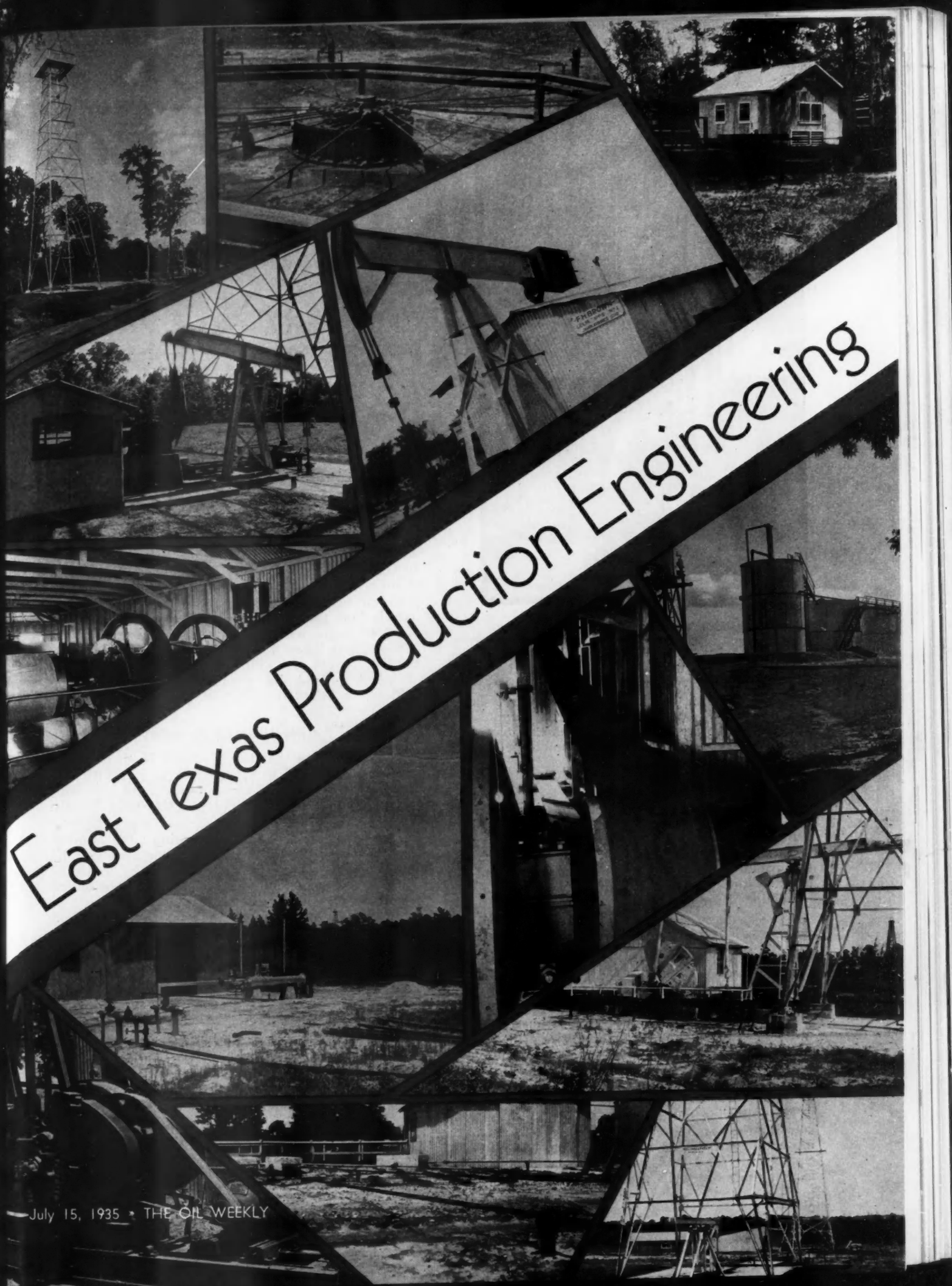
Close spacing of wells has not been restricted to the independent units. Many majors have developed leases, allegedly to equalize drainage with neighbors, to a density comparable to some of the worst offenders. Some of the majors also confined their purchases to densely drilled leases in order to enjoy a high return on their investment, although only one major has bought properties in the field since the first of the current year. The large units have occasionally resisted each other's excessive drilling policies by resorting to the courts.

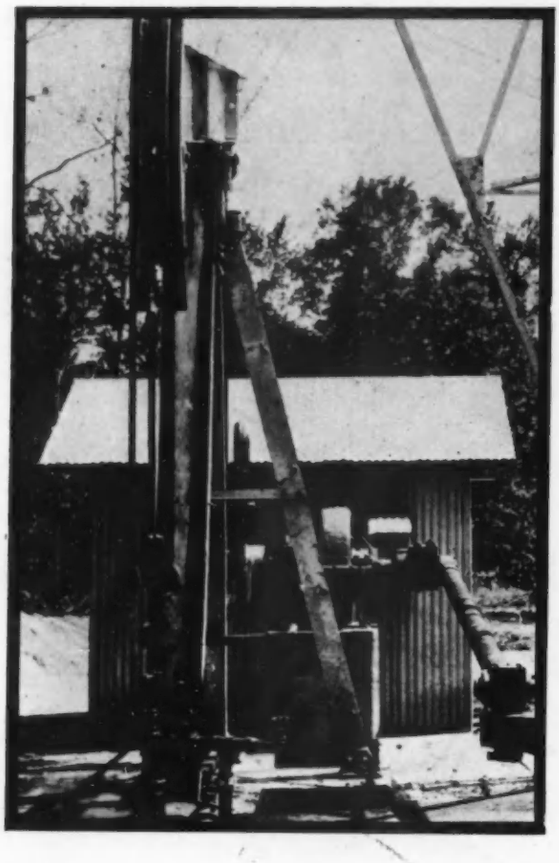
Suits Are Filed

Magnolia Petroleum Company has filed suit in Travis County 53rd District Court to force the Railroad Commission to set aside an order that authorized D. H. Sanford, Longview, et al, to drill and complete last May an oil producer on the J. W. C. Edwards and J. B. Cowden 8/10-acre lease, David Ferguson Survey, Upshur County. This well is situated on the north line of the plaintiff's H. Hampton 169-acre lease, bearing 16 completed wells. Magnolia Petroleum Company also filed suit to compel the commission to order Alex C. McCutchin, Arp, Texas, and associates, to plug T. O. Wright 4, completed in July, 1934, on a five-acre lease, Juan Vargas Survey, Smith County. This contested well is an east offset to the plaintiff's Irion Wright 166-acre lease, which has 30 completed wells.

Humble Oil & Refining Company was scheduled to press its demands July 13 in the 126th District Court of Travis County for the commission to order Hugh J. Wilder, A. R. McElreath and F. W. Suggett to plug the fourth well drilled on the latter's S. E. Brox 20-acre lease, T. Grace Survey, Rusk County. The lease in question was purchased recently from J. E. Farrell & Company, and the present owners have since drilled two wells. Brox

[*Continued on page 106*]


East Texas Production Engineering



East Texas 30,000

By J. S. HUDNALL, Hudnall & Pirtle
Consulting Geologists and Engineers
Tyler, Texas

THE East Texas oil field was discovered on October 12, 1930. Hence, it has had a productive history of almost five years. However, most of the production has occurred during the past four years. During the past two years there have been a number of changes observed in East Texas, which have an important bearing upon the type of pumping equipment to be used. The operator who is selecting pumping equipment today is using different type of equipment from what he would have, had he selected the equipment two years or more ago. One of the chief causes for this change in the type of pumping equipment being installed today, as compared to that installed in the earlier days of 1932 and 1933, is the change in the drilled density of the field as a whole, and particularly the area surrounding the lease which is to be equipped for pumping.

Effect of Greater Well Density

During the year 1932 and the early part of 1933, the most optimistic writers, and those who were familiar with the East Texas field estimated that the maximum number of wells would be from 12,000 to 15,000. Today, the same observers estimate that the ultimate number of wells that will be drilled in the East Texas field will be between 35,000 and 40,000. There are at this time 18,000 producing wells in the field, with every indication that 20,000 will be drilled by January, 1936.

The following outlines will show the effect of increasing the number of wells upon the type of pumping equipment that is to be used. The general principle in all sand fields, especially Woodbine fields, is that the more wells there are drilled in the field, the greater will be the recovery per acre, but the less will be the recovery per well. Hence, each additional well that is added to the field will reduce the total amount of oil that is to be pumped from the other wells adjacent to it. To illustrate: If the field, as a whole, were to be drilled to a density of one well to 10 acres, the total recovery from the field would be estimated by most geologists and engineers familiar with the field, as being approximately 3,000,000,000 barrels from the 130,000 acres. This would be a total of 13,000 wells, which would ultimately produce the 3,000,000,000 barrels. This would be equivalent to 230,769 barrels per well, approximately 60 percent of which would be produced by the pumping method, or 138,461 barrels per well.

Larger Ultimate Recovery

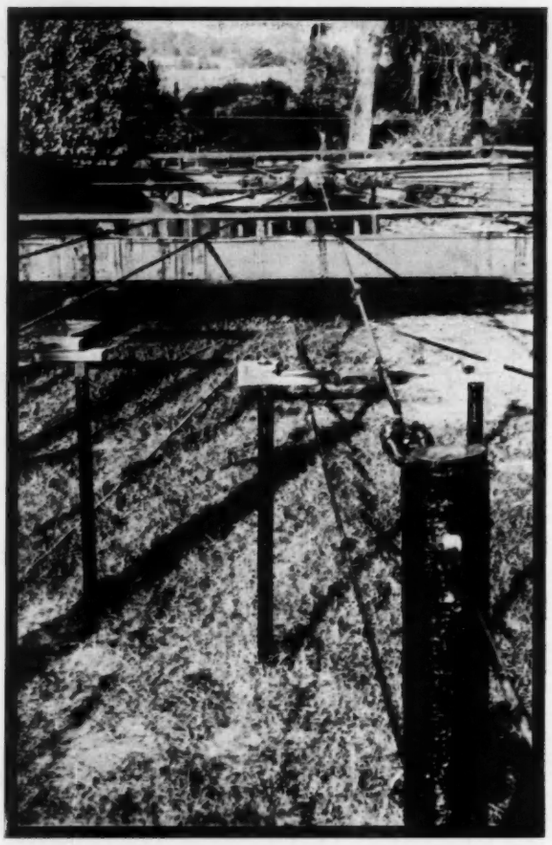
It now appears that the field will be drilled to a density of one well to four or five acres. With this drilled density, I estimate that the field will ultimately produce approximately 4,000,000,000 barrels.

Cutler's theorem as outlined in a report by the Bureau of Mines, is that if four times the number of wells are drilled, the recovery per acre will be doubled. This, of course, would have its limits in any area, but no doubt would be applicable where the spacing would be one well to 20 acres, but less applicable where the spacing was one well to 10 acres, and likewise, still less applicable in reducing spacing to below one well to five acres. However, applying Cutler's theorem to the East Texas field in drilling the field to a density of one well to five acres, instead of one well to 10 acres, the recovery should be increased by 50 percent, bringing the total ultimate recovery estimate up from 3,000,000,000 barrels to 4,500,000,000. It is the writer's opinion that this estimate is too great and that the Cutler theorem would be applicable to the extent of one billion instead of one billion five hundred million barrels.

Using a total ultimate recovery estimate of 4,000,000,000 barrels, which the writer believes is entirely probable in the East Texas field, and drilling the field to a density of one well to four acres, the total number of wells would be 32,500 on the 130,000 acres. Thus, the total recovery per well would be

May Pump Wells

MANY FACTORS INVOLVED IN SELECTING EQUIPMENT



32,500 wells divided into 4,000,000,000 barrels, which equals 123,076. Assuming that 60 percent of this will be produced by the pumping method, the average amount of oil that would be pumped by each well would be 73,845 barrels, as compared to 138,461 barrels which each well would pump had the drilled density remained at one well to 10 acres. It is obvious that a well that is to be equipped to lift 73,845 barrels would use an entirely different type of pumping equipment to that that would be required to lift 138,461 barrels. This is probably the most fundamental change that has occurred during the past few years, relating to the type of pumping equipment that is to be used, as there are a lot of local conditions of this same question of density which have an even more significant bearing on the problem of selecting proper pumping equipment. To illustrate; The Sabine River Bed is, at this time, drilled to a density of one well to approximately 2.5 acres. A large area adjacent to the river also is already drilled to a greater density than one well to four acres. It is obvious that in these areas the recovery per well would not be as great as it will be in the areas where the drilled density will average, at the end of the development period, one well to six or seven acres. Hence, it would be unwise to equip the wells in such areas with as heavy pumping equipment as they would in the less densely drilled areas.

EAST TEXAS MAP INSERT

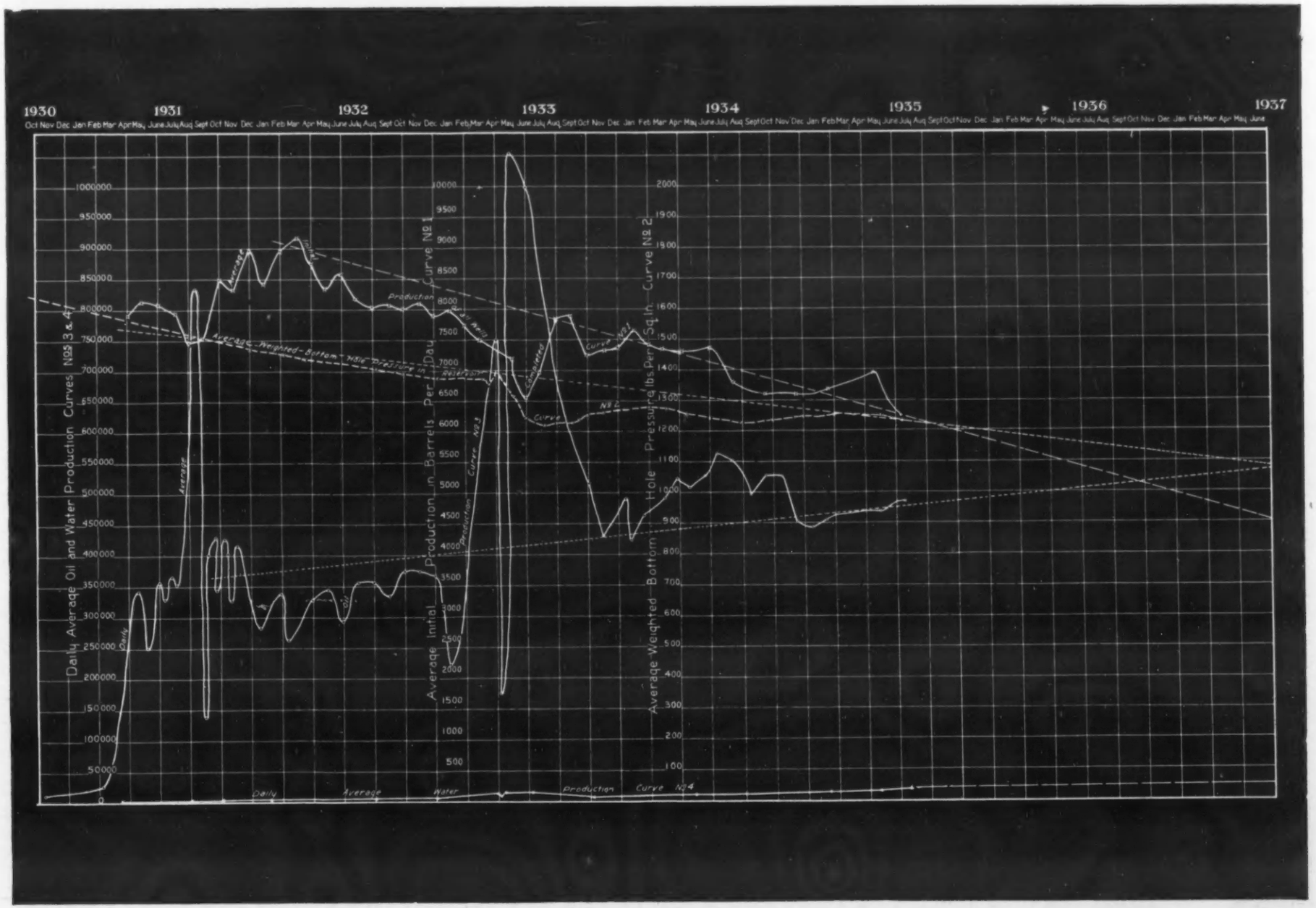
A special insert supplement map, showing the classes of ultimate recovery by pumping methods, and classified as to the desirable type of pumping equipment, will be found in this issue. It was prepared specially for THE OIL WEEKLY by Mr. Hudnall, author of this article, and brings to date a map that accompanied his article "Fundamental Considerations in The Selection of East Texas Pumping Equipment", which appeared exclusively in THE OIL WEEKLY, July 17, 1933.

In the London Townsite there are, at this time, approximately 150 wells on 100 acres. These wells will not pump as much per well as the area one and one half miles north of it, where the drilled density at this time is approximately one well to eight acres, the ultimate drilled density of which will probably be one well to six acres. The recent extensions in the Joinerville area to the east of the old producing part of the field is an excellent example of the same condition. The drilled density of a large part of this area is reduced already to one well to four or five acres with every indication that the ultimate drilled density will be approximately one well to three acres. This greater drilled density, where the sand section is so thin, undoubtedly means that the average well in this area will pump a total of from 30,000 to 50,000 barrels.

The prudent operators are taking advantage of this condition and equipping most of the wells in the Joinerville area with light pumping equipment and in a great many cases six to ten wells are being pullel from a central power, thereby reducing the cost of the pumping equipment per well to $1,500.00 or $2,000.00 each, while in the center of the field, the common practice, where equipment has been installed, is to put in single well units at an average cost of $4,500.00 each with a maximum cost of $6,300.00.

The following are the factors which the writer wishes to call special attention to in selecting pumping equipment for the East Texas field:

1. The thickness of the saturated sand in the area of the lease.
2. The drilled density of an area of 500 acres or more surrounding the lease.
3. The permeability of the sand.
4. The location of the lease with reference to the structure.


1930
1931
1932
1933
1934
1935
1936
1937
Daily Average Oil and Water Production Curves Nos 3 & 4
Average Initial Production in Barrels Per Day Curve No 1
Average Weighted Bottom Hole Pressure lbs Per Sq In Curve No 2
Average Weighted-Bottom-Hole-Pressure in Relation
Production
Curve No 2
Curve No 3
Daily Average Water Production Curve No 4

Pumping in the East Texas field is dependent upon a number of important reservoir factors, which are shown on the chart appearing on the opposite page.

5. The distance the lease is from a thick sand area from which to draw the oil in case the lease under consideration is in a thin sand area.

6. The bottom-hole pressure of the area in which the lease is located and the rate at which the pressure has declined from the beginning of production up to the present time.

The writer has attempted to show the first of these fundamental questions on the accompanying map, showing the general classification of the wells which are expected to pump the greatest amount of oil in Class "A", which group includes wells which are expected to pump from 80,000 barrels average to 133,000 barrels; Class "B" wells whose ultimate recovery by pump will be from 50,000 barrels minimum to 80,000 barrels maximum; Class "C" wells whose ultimate recovery by the pump will be from 30,000 barrels minimum to 50,000 barrels maximum.

Economic Considerations

There have been a number of changes during the past two years, which have a vital bearing upon the economic consideration for the supply man as well as the operator. The most important change that has occurred during the past two years is the extension of East Texas around the margins of the pool. Most of the new extensions have occurred in thin sand areas, where pumping equipment is going to be necessary in the immediate future. During the past two years, there have been in excess of 10,000 acres added to the producing area of the field, bringing the total producing area of the oil bearing part of the field up to 130,000 acres, giving the total area of the field, including both the oil and the gas portions, approximately 135,000 acres. There is every indication that the field will ultimately have in excess of 140,000 acres inside of the producing limits, with a very strong likelihood of its covering 150,000 acres. The field is so large that an extension of one location, a strip 660 feet wide, entirely around the field adds to the field approximately 10,000 acres. It is entirely probable that the field will be extended on an average of two or three more locations.

On the accompanying map, showing the classification of the ultimate recovery by pumping methods, may be seen the new extension areas or the areas which have been added to the field during the past two years. Should the field ultimately have 150,000 producing acres and be drilled to a density of one well to four acres, the total number of wells would be 37,500. It is of considerable importance to the supply industry to see the opportunity afforded them in equipping this number of wells at an average cost of $3,000 per well. The total cost of equipping these wells would be $112,500,000, which is a sufficient volume of business to support an industry within itself.

What Time Will the Field Go on the Pump?

Probably no question is more important to the operator, as well as the supply business, than the question, as well as the supply business, than the have to be pumped. Many estimates have been made by the engineers and geologists in the past, as well as estimates by old experienced operators, that have been proved erroneous during the past two years. The writer is one among those who made estimates that have been considered an error as to when the East Texas field may be expected to go on the pump. However, the past two years history of the field gives considerably more data upon which to base an estimate of when the wells will require pumping equipment. There are at this time between 1500 and 2000 wells in the field which require either agitation or pumping in order to make their allowable. Every month there is an addition to the pumping number. Since there are at this time 18,000 completed wells in the field, with only 2000 pumping, the remaining 16,000 will have to be pumped at some time in the future, although approximately 1500 of this 16,000 are equipped already for pumping, but the pumping equipment is idle. Deducting this 1500 from the 16,000 leaves 14,500 of the wells that are now producing which will have to be equipped for pumping some time in the future at an average cost of $3,000 per well. This will require a total expenditure of $43,500,000 for pumping equipment on the wells that already have been completed. Should the wells start going on the pump at a rate of 100 per month, it would require slightly over 12 years for all the wells to go on the pump. There can be but little doubt that the rate at which the wells will go on

East Texas Pumping Highlights

★ **Field may ultimately be drilled to density of one well to four or five acres, with a total of 32,500 wells or more likely.**

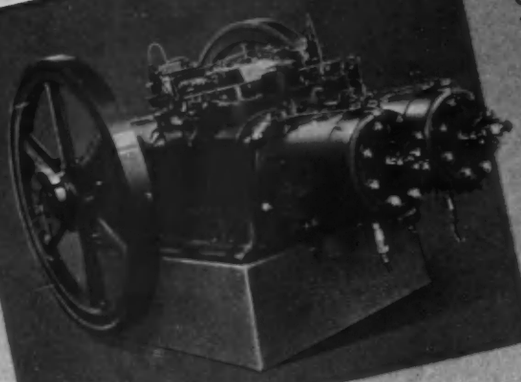
★ **Ultimate recovery is estimated at 4,000,000,000 barrels, with each well producing an average of 12,076 barrels, of which 60 percent would be artificially lifted.**

★ **At an average installation cost of $3,000 per well, the total expense in equipping these wells would be more than $100,000,000.**

★ **To equip present producing wells (16,000) on which lifting equipment has not yet been installed would cost $43,500,000.**

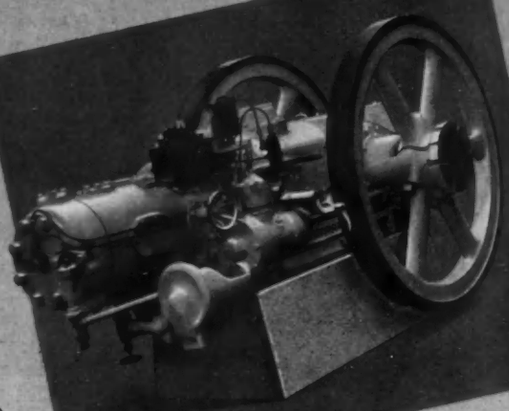
★ **If 28,000 wells go on the pump during the next six years, this would be an annual rate of 4,666, or 383 wells per month at a monthly expenditure of $1,149,000.**

All Diesels are Economical
These are *Simple* and *Reliable*



Left — The Cooper-Bessemer Type G-AW twin-cylinder Diesel rated 100 H. P. Has two-cycle simplicity. Can be converted to a gas engine.

Below — The Cooper-Bessemer Type G-AO single-cylinder, two-cycle Diesel rated 45 H. P. This engine can be converted to operate on gas.

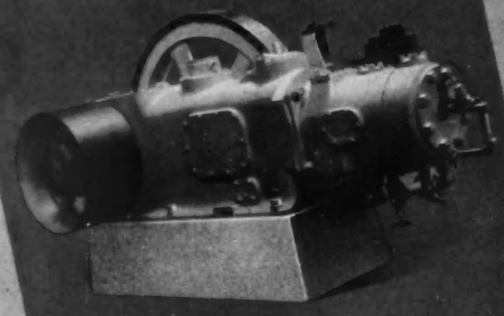


Cooper-Bessemer designed these Diesels to meet the special requirements of the oil fields.

The first requirement of a Diesel pumping engine is reliability. But, aside from that, these engines are so simple that no Diesel experience is required to operate them.

These engines will start in the coldest weather and are built for twenty-four hour continuous operation. Low maintenance costs are assured by such features as box type main frame, Timken main roller bearings, die forged crankshafts, drop forged connecting rods and fully automatic lubrication.

Write or call any of our branch offices for complete information on Cooper-Bessemer oil field Diesels. 25 to 1200 H.P.

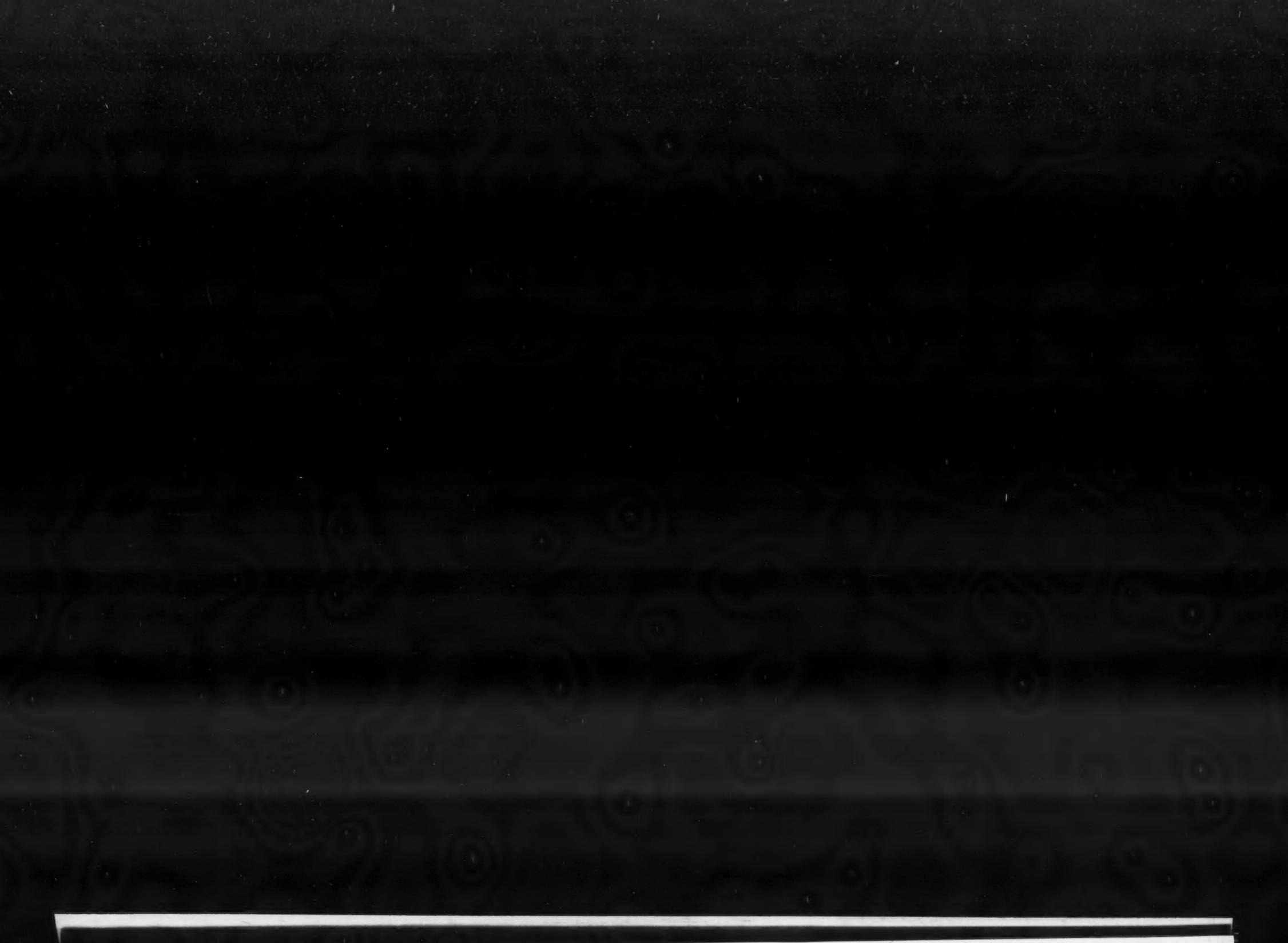


Right — Type G-AO equipped with one heavy flywheel and belt pulley. This single has the same modern construction features as the larger twin. Both are cold starting full Diesels.

THE COOPER-BESSEMER CORPORATION

Mt. Vernon, Ohio — PLANTS — Grove City, Pennsylvania

640 East 61st Street, Los Angeles, Calif. | 201 East First Street, Tulsa, Oklahoma | Magnolia Building, Dallas, Texas | 25 West 43rd Street, New York City | 225 Crockett Street, Shreveport, La. | 505 Esperson Building, Houston, Texas



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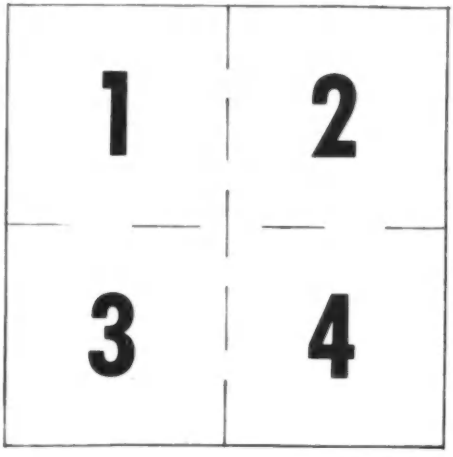

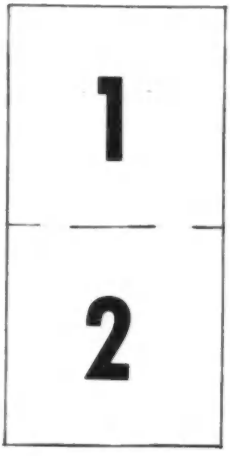

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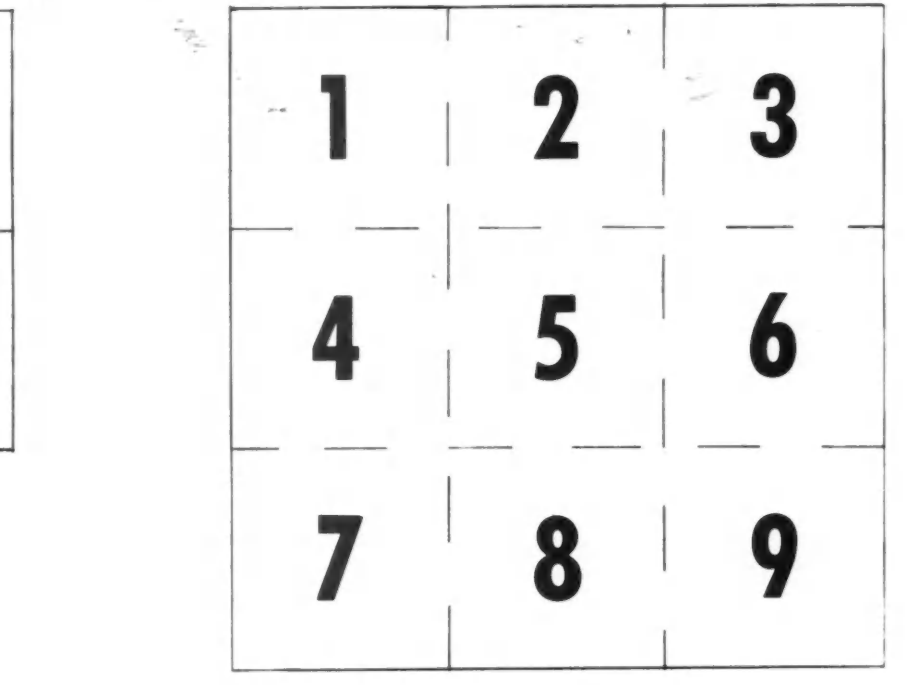


MAP OF
EAST TEXAS OIL FIELD

SHOWING

THE CLASSES OF ULTIMATE RECOVERY BY PUMPING METHODS.

Compiled by HUDNALL & PIRTLE - Consulting Geologists - Tyler - Texas

SCALE

0 4000 8000 16000 FT

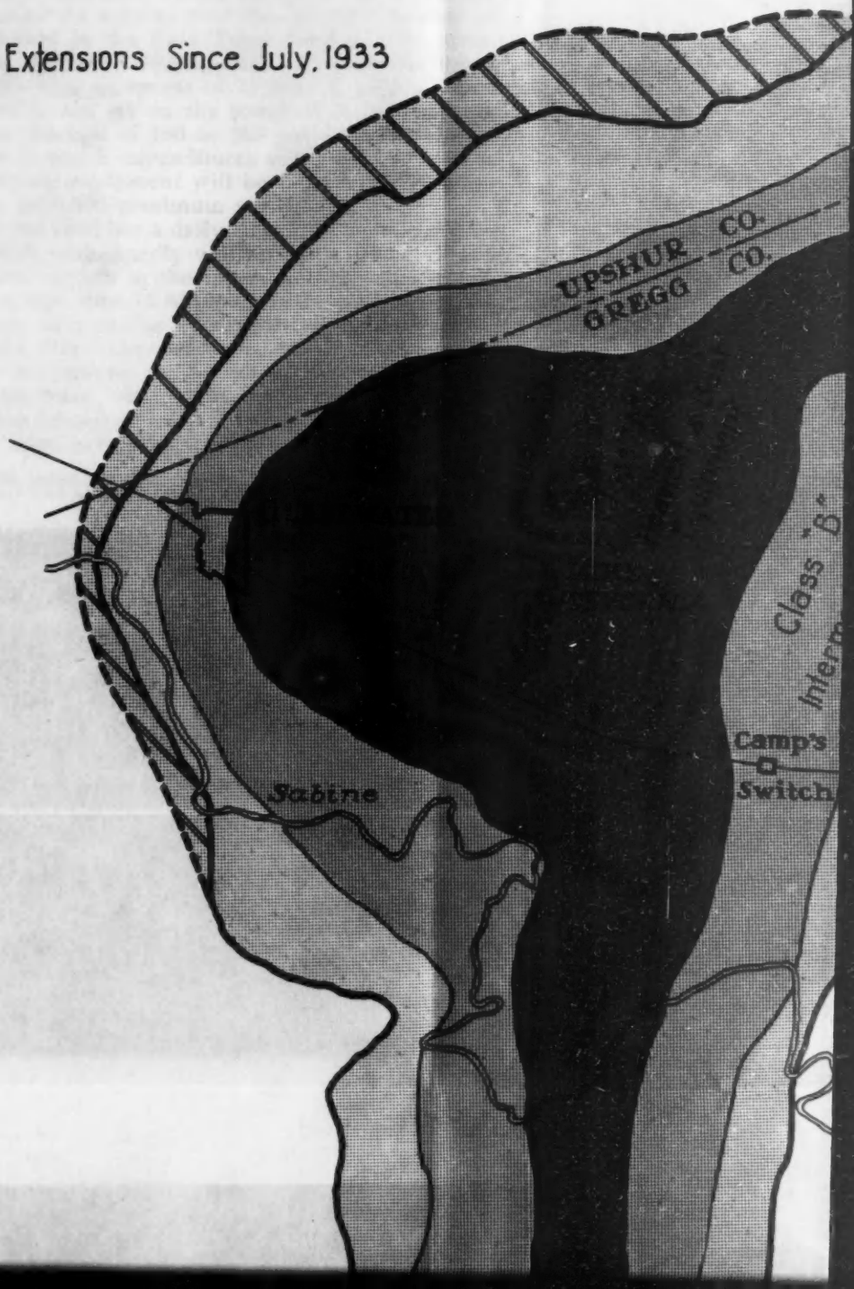
LEGEND:

Class "A" Ultimate Recovery by pumps of 80,000 to 133,00

Class "B" Ultimate Recovery by pumps of 50,000 to 80,000 Bbls.

Class "C" Ultimate Recovery by pumps of 30,000 to 50,000 Bbls.

Extensions Since July, 1933



L FIELD

JAMESTOWN

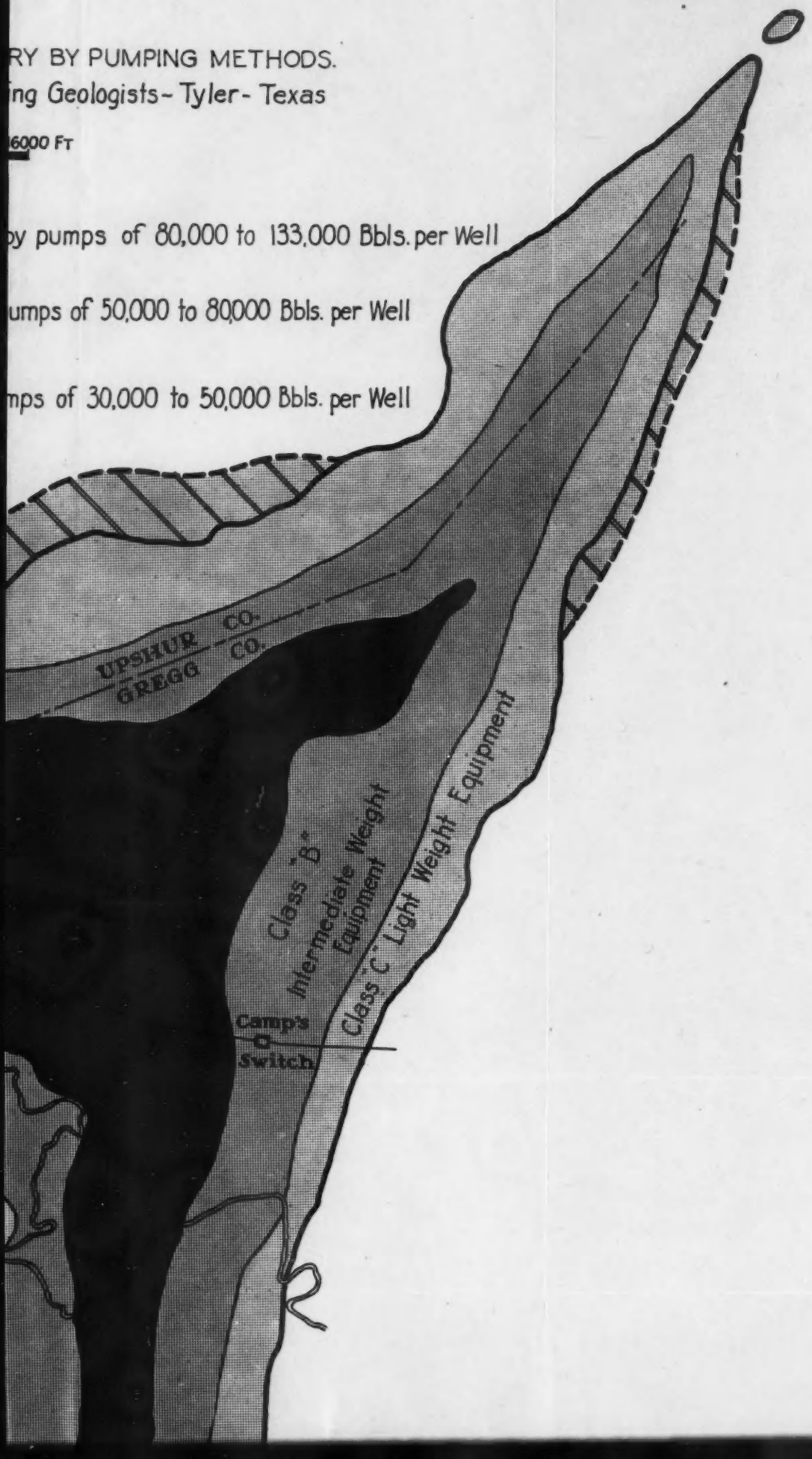
RY BY PUMPING METHODS.
ing Geologists - Tyler - Texas

6000 FT

by pumps of 80,000 to 133,000 Bbls. per Well

umps of 50,000 to 80,000 Bbls. per Well

mps of 30,000 to 50,000 Bbls. per Well

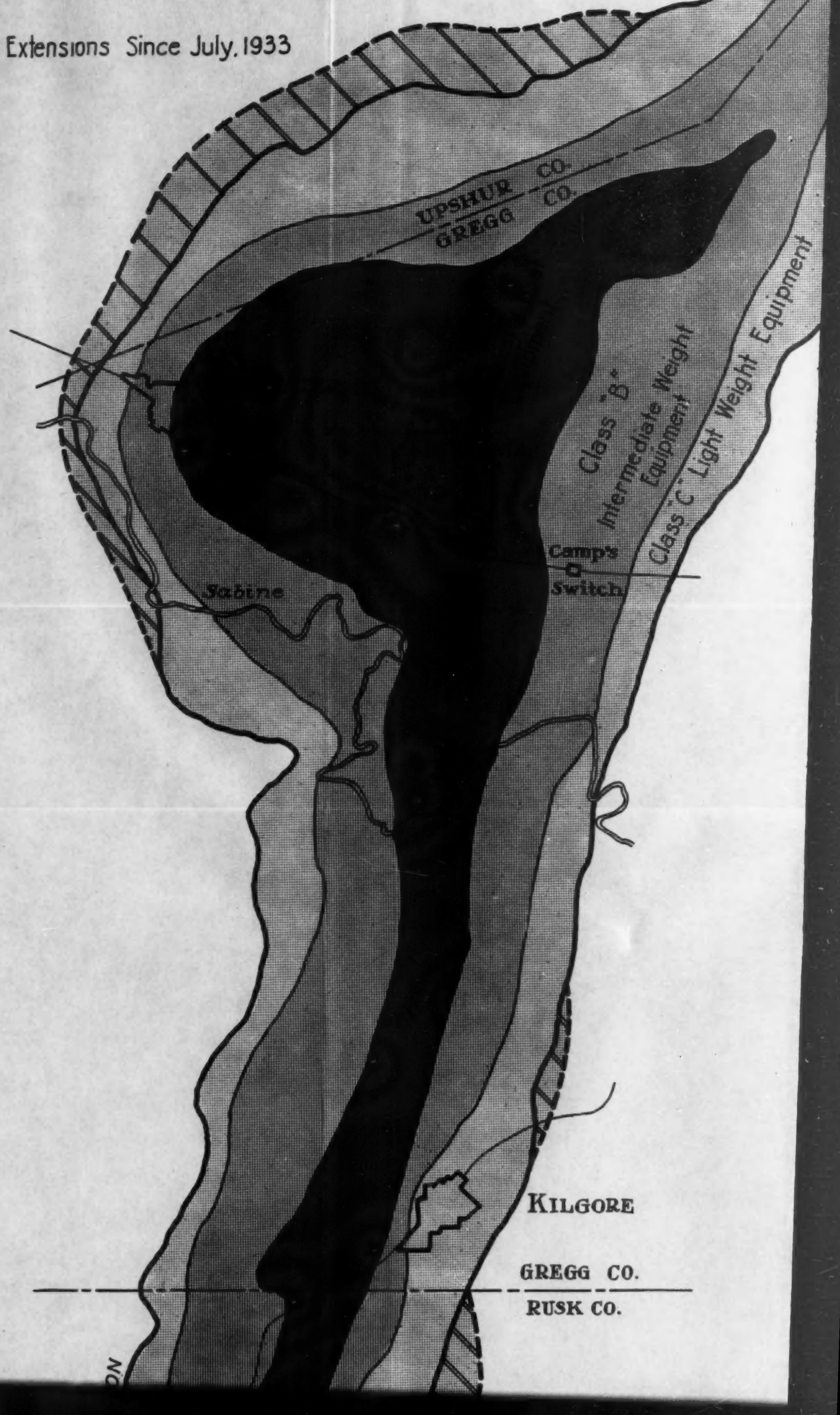


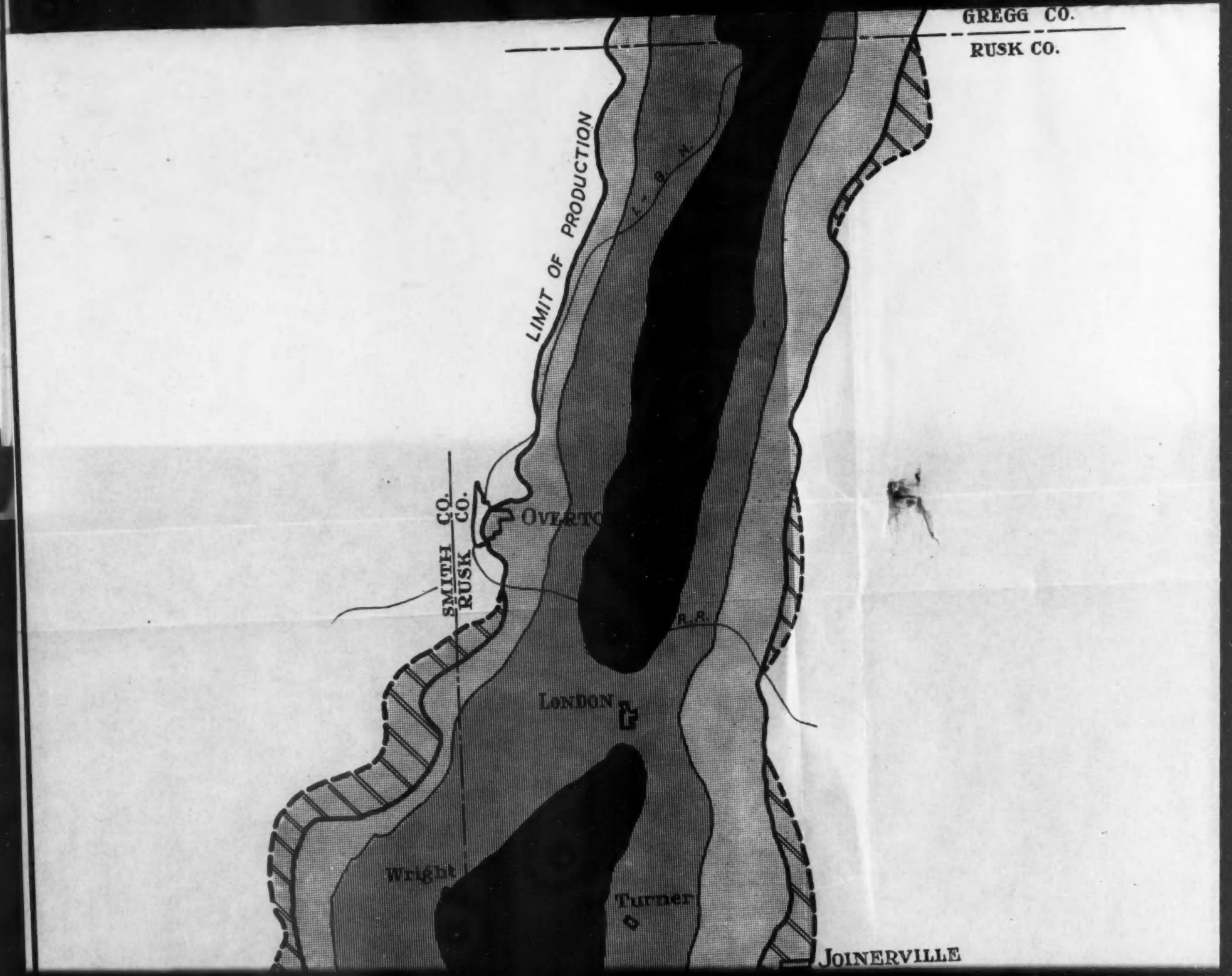
Class "A" Ultimate Recovery by pumps of 80,000 to 135,000 Bbls. per Well

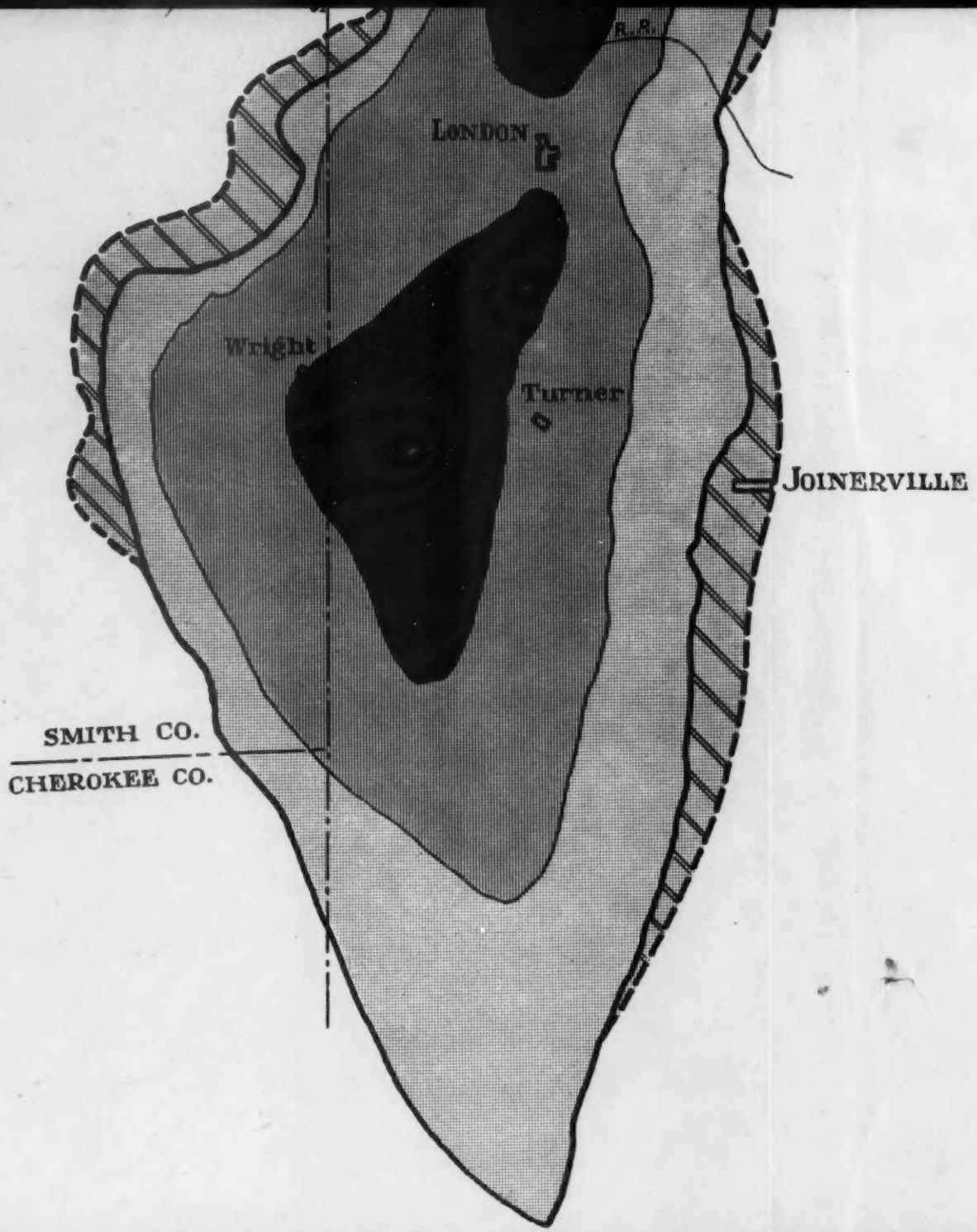
Class "B" Ultimate Recovery by pumps of 50,000 to 80,000 Bbls. per Well

Class "C" Ultimate Recovery by pumps of 30,000 to 50,000 Bbls. per Well

Extensions Since July, 1933




GREGG CO.
RUSK CO.
LIMIT OF PRODUCTION
K. C. S. R.
SMITH CO.
RUSK CO.
OVERTON
T. & P. R. R.
LONDON
Wright
Turner
JOINERVILLE



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This map replaces an
in THE OIL W

Published as a

Special Supplement

To the article "East Texas May Pump 30,000 Wells", by J. S. Hudnall.

EAST TEXAS PRODUCTION ENGINEERING NUMBER

July 15, 1935

THE OIL WEEKLY

Houston, Texas.

This map replaces and brings todate a map published in THE OIL WEEKLY, July 17, 1933.

the pump will be a gradual increased rate, if the field production is maintained at any uniform rate of flow.

Since we estimated that the minimum number of wells that will ultimately be drilled in the East Texas oil field will be 30,000 from which, if we deduct 3500 wells that are now equipped for pumping, the remainder is 26,500 wells which will have to be equipped in the future. At an average cost of $3,000.00 each, the future expenditure of 26,500 wells for pumping equipment would be $79,500,000.00. Since only 2000 of the 30,000 wells which we contemplate will ultimately be drilled are now on the pump, it would require approximately 12 years for the 28,000 wells to go on the pump, at a rate of 200 wells per month.

No engineers have dared to estimate that the field will be flowing for 12 years. However, it is entirely possible that a number of wells will be flowing this long. Our best estimate is that most of the wells will be on the pump within five years from the present time. Assuming that all the wells will be on the pump in six years, the following would be the rate at which they would go on the pump:

If there are 28,000 wells to go on the pump in six years, this would be at an annual rate of 4666 per year or 383 wells per month. At an average cost of $3,000.00 per well, this would require a monthly expenditure of $1,149,000. Should any chaotic condition develop, which is entirely possible under proration and the field be permitted to produce at a rate of 1,000,000 barrels per day, there is no doubt but what thousands of wells in the East Texas field may go on the pump within 60 days.

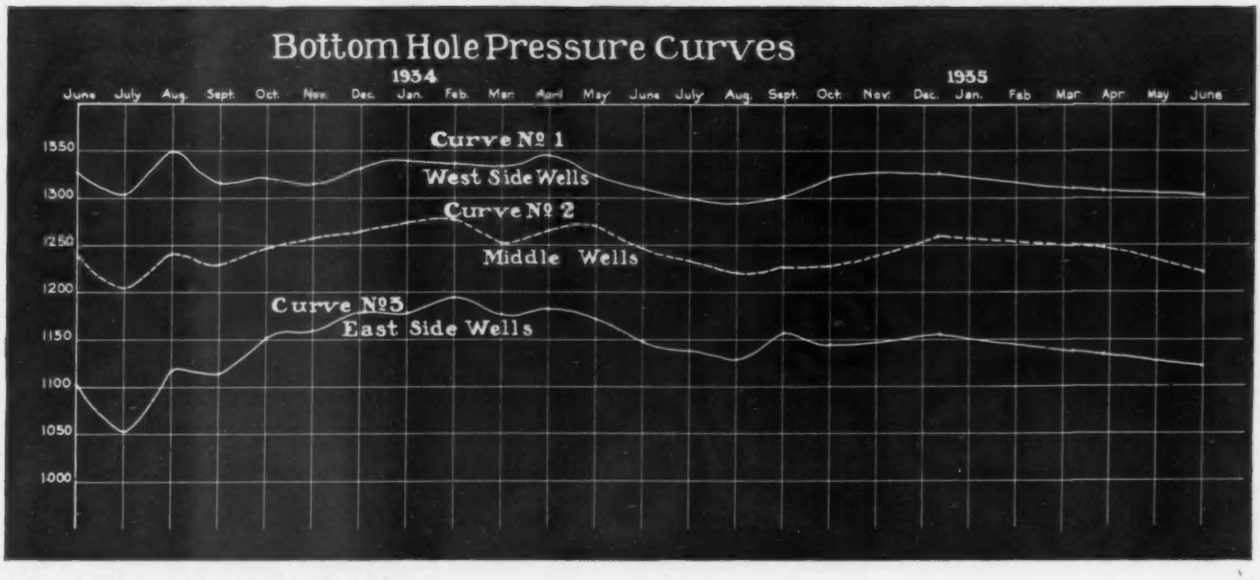
The writer has prepared a chart showing some of the important factors that have an important bearing upon the time in which the field will go on the pump. The chart shows four curves, namely: the average initial production of the wells when reduced to open flow gauges through the casing; the curve showing the bottom-hole pressure, and the curve showing the daily rate of production of water, are all important illustrations of the performance of the East Texas oil reservoir. A study of the bottom-hole pressure decline curve shows that the average reservoir pressure has declined but very little during the past two years. I am of the opinion that a large part of this pressure maintenance has been due to the drilling of additional wells in between those that are producing, the new wells piercing isolated sand lenses where the pressure varies from a few pounds to a few hundred pounds above the average pressure in the wells around it. The drilling of the new wells connect up the various sand members and permit the members having a higher reservoir pressure to flow into those with a lower reservoir pressure, thereby tending to maintain or raise the average of the pressure in the old wells that are tested. This, plus the subsidence which may be occurring in the sand, no doubt are the chief contributing factors to pressure maintenance. In addition to these two factors, the upward encroachment of water from the sand below the producing zone in the western half of the field has no doubt contributed considerable volume of water which has tended to maintain the pressures in the western part of the field. The fact that the total water production from the field has never increased at a rapid rate, still remaining around 12,000 barrels per day, is self evident that the water encroachment into the field has been very small in comparison to the total volume of oil removed, the same being 760,000,000 barrels that has been produced.

Conclusion

Based upon observations that have been made in the East Texas field during the past four years, the writer is of the opinion that the ultimate number of wells drilled in the East Texas field will be something in excess of 30,000, with a strong likelihood of its reaching in excess of 35,000. I estimate that these wells will go on the pump at a rate varying from an average of 100 to 200 per month. Hence, the rate at which expenditures will have to be made for pumping equipment will be from $300,000 minimum to $600,000 maximum per month.

Since the field has a daily allowable of 460,000 barrels, which undoubtedly will be increased to 500,000 or 600,000 barrels in the future, the monthly allowable is at this time 13,800,000 barrels, which nets the operators, after paying all royalty, taxes, labor, overhead, etc., 62½ cents per barrel, while on the pump. A total net income per month to the entire field is 13,800,000 times 62½ cents or $8,625,000. This is ample net income to pay all pumping equipment and leave a large net profit for the lease owner.

Note—The bottom-hole pressure curves used in this report were made from data supplied by the Engineering Department of the Railroad Commission.



Average Power Costs

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These figures represent a number of installations in different fields, over a period of approximately four years, under widely varying field, well and operating conditions.

The detailed records of these plants provide ample evidence of the possibilities of greatly extending the present limitations of efficient, economical pumping to wells of practically any depth, and of average or extremely difficult production characteristics. These data will be supplied to production executives on request.

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Gas-Lift Operations

[IN EAST TEXAS ARE PROVING PRACTICAL DESPITE RESTRICTED WELL ALLOWABLES

By S. F. SHAW, Consulting Engineer,
San Antonio, Texas.

INASMUCH as it has been necessary to curtail allowables to a very low percentage of a well's ability to produce, development and production of oil in the East Texas field have not been conducted under conditions that encouraged the widespread use of gas- and air-lift that accompanied lifting work in other Woodbine sand pools, such as Powell, Wortham, Currie and Richland. Under this condition of restricted production, reservoir pressures in the East Texas field have been maintained at a high point, and up to a recent date most wells have produced their allowables by natural flow.

In the early life of the East Texas field, Sinclair Oil & Gas Company (now Sinclair Prairie Oil Company) installed a plant with three small compressors for flowing wells on the Holland lease in the Joiner section, and favorable results were obtained. This operation was stopped by court injunction. About the same time, Tide Water Oil Company also installed a gas-lift plant, consisting of four small units, on the Finney lease in the same part of the field, and was able to obtain increased production after the wells ceased to flow naturally. This operation also was suspended at approximately the same time as that of Sinclair Prairie Oil Company.

Producing Conditions

With extension in development in this enormous field, it became impossible to produce wells at large volumes, owing to lack of market demand, to inadequate transportation facilities, and to insufficient storage capacity; consequently, the phase of gas-lift production looking toward increased capacity had to be discontinued at an early date.

In the central part of the field, where the productive sand is thickest, the reservoir pressure has continued at a rather high point, the initial pressure of approximately 1650 pounds having declined to only 1213 pounds as of June 1, 1935, which covers a period of more than four years. Also, very little water has invaded this portion of the field. Under these conditions, natural flow has continued at the majority of these wells up to now. Since the allowable could be obtained at all times by natural flow, there has been little occasion to install any form of artificial lifting equipment in the central part of the field.

Speculation as to when the wells in the East Texas field would cease flowing, started two or three years ago[1] [2], when reservoir pressures began to show an apparently rapid decline due to withdrawals of more than one million barrels per day. Soon afterward, proration came under better control, and production lower, thus slowing down the decline in pressures, and since that time most wells have been able to flow their production under the conditions of the small allowables that have been established.

Around the edges of the field, however, producing conditions have been less favorable[3]. Water encroachment has been serious in various places on the north, west, and south edge of the field, and of late a small amount of water has been encroaching along the east edge of the field.

Even though pressures have remained high along the west edge, there has been need for lifting equipment when water encroachment sets in, and any one driving along the edges of the East Texas field probably will be surprised at the large number of wells equipped with pumps and air-lift plants. This concentric band of mechanically produced wells is steadily expanding and working inward toward the center of the field and it is only a matter of time before most of the field will require artificial lifting methods to extract the oil.

The small allowables have greatly changed the methods that have been, and can be, employed for lifting the oil. The revenue obtained from a well in the East Texas field during the course of a month does not allow the producer much margin with which to install expensive equipment, consequently financial difficulties are encountered when installing the more costly equipment, unless the operator is one of the major companies that does not have to pay for the lifting equipment out of current revenue.

Gas-Lift Installations

One of the early leases affected by encroachment of water was the Barnett lease of Welch-Sandler Company, on the west edge of the field, between Kilgore and Gladewater. Two-inch tubing, equipped with starting collars, had been run into the wells and functioned for a short time, but the encroachment of water became so severe that the gas present with the oil was insufficient to flow the combined water-oil mixture to the surface. The lease consists of six wells, having a depth of approximately 3600 feet.

A 90-horsepower, duplex, two-stage compressor was installed with capacity of about 560,000 cubic feet per day, and the six wells have been operated with this equipment for the past two years. The cost of the equipment, including compressor plant and starting valves, averaged about $1,400 per well. There seems every reason for believing that with this method the wells on this lease can be carried to the point where they would normally be abandoned.

Production engineers of some of the major companies are of the opinion that wells in the East Texas field can be carried to depletion by gas-lift. Moreover, they feel that the economic field for gas-lift is as great or greater in wells where production is restricted than in pools produced at maximum capacity, owing to the lower initial cost of the equipment for producing small wells and the longer period during which this equipment would be in service.

Not long after water became a serious problem along the west edge of the East Texas field, it became increasingly evident that wells along the east edge of the field would require artificial methods, owing to the thin and not very permeable sand existing in places along that edge. Moreover, close spacing of wells in certain areas on the east side has reduced the reservoir pressure to the point where natural flow cannot be depended upon to supply the allowables.

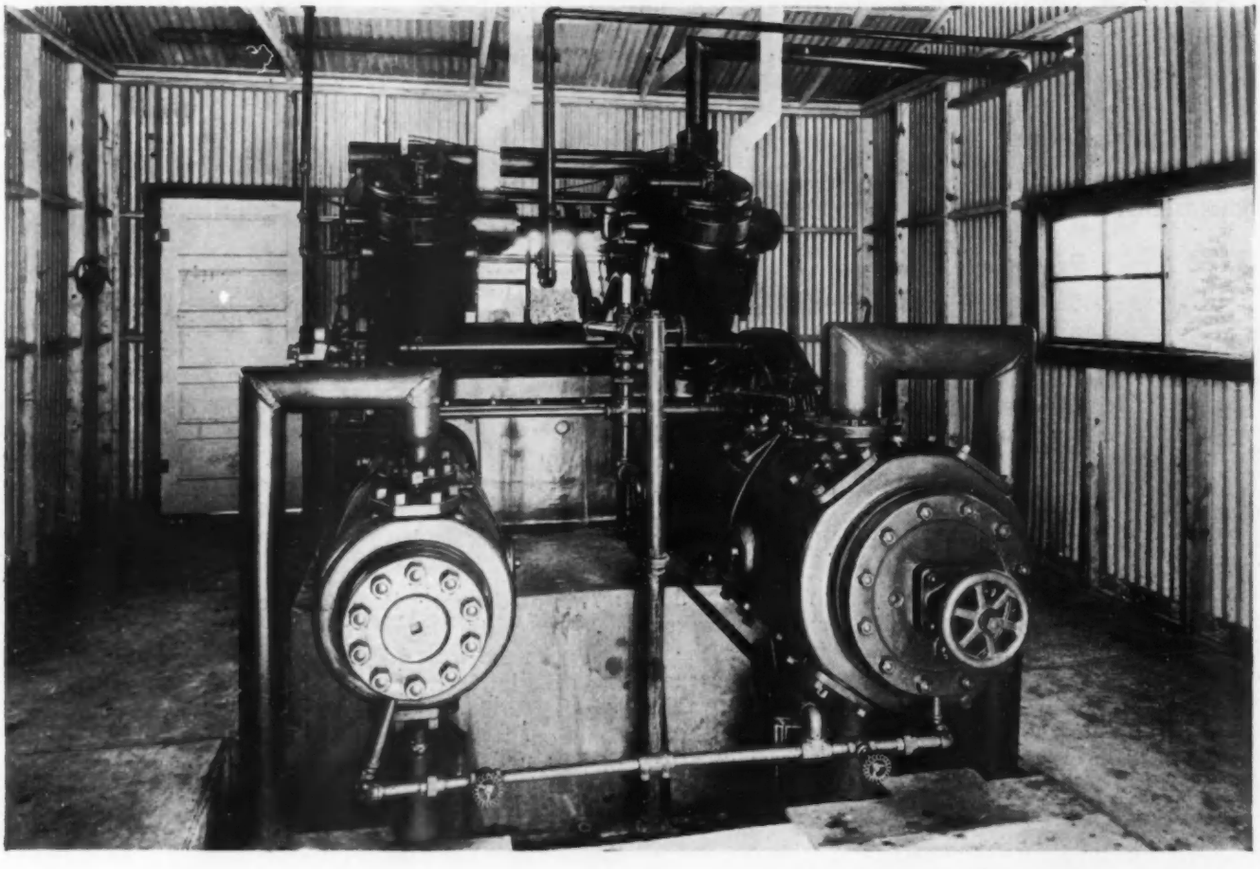
More than a year ago, two or three small compressor plants were installed in the Kilgore area to lift the production in this densely-drilled section. One of these plants, built by Roy Reynolds on the J. S. Elder lease to handle three wells, contains a compressor, belt-driven from a 50-horsepower electric motor, with displacement of about 330,000 cubic feet per day. Another plant was later installed by T. D. Humphreys interests on the A. Spear lease, on which some nine or 10 wells had been drilled. This plant consists of a 90-horsepower, two-stage compressor. The average installation cost per well was about $1350, covering the cost of the compressor plant and the starting valves.

In addition to the small plants employed for handling air-lift operations in the East Texas field, there are two gasoline plants built by Humble Oil & Refining Company, which have been servicing some 15 or more wells in the Kilgore and London areas as experimental projects, and it is reported that plans have been formulated for operating 200 or more wells on gas-lift from these gasoline plants.

Marathon Oil Company has been employing gas-lift on some of its wells in the south part of the field in the Carlisle area,[4] using gas from a gas well during the experimental stage. Other large companies are reported to be working out plans for placing a considerable number of wells on gas-lift.

During the past two years, permits have been taken out to place approximately 950 wells on air-

Interior view in the B. A. Skipper Production Company's Clayborne gas-lift plant which is operating eight wells.



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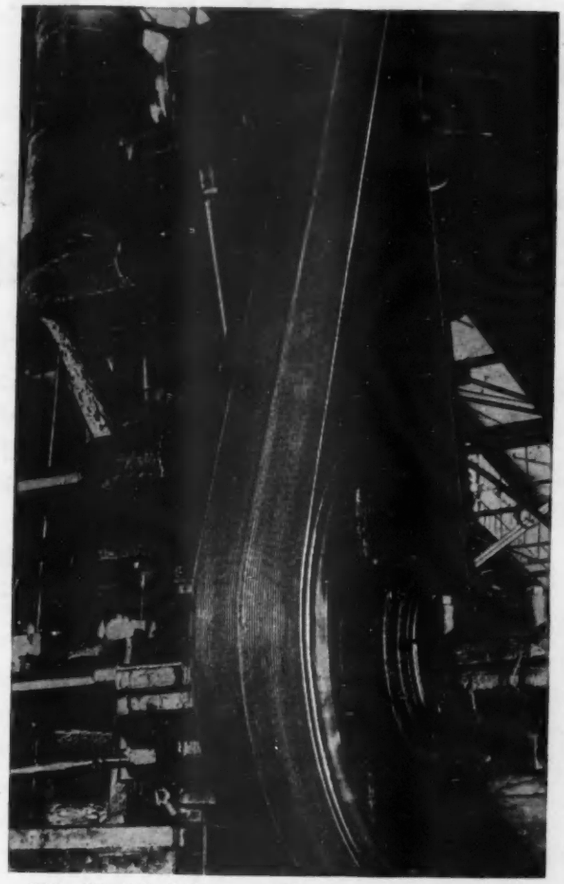

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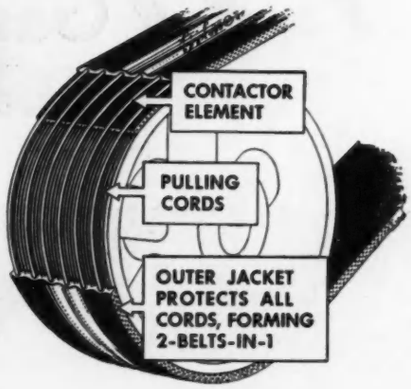

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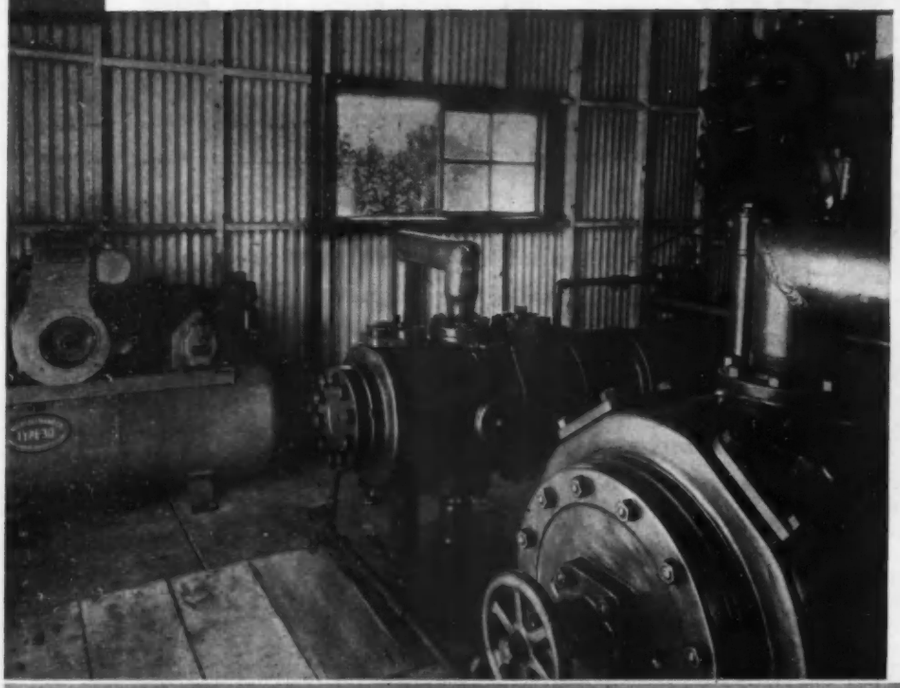

You can maintain complete standardization and still add compressor capacity exactly as it is required and as increased allowables or additional wells justify the investment . . . working parts on all sizes are interchangeable.

This smooth-running unit, a vertical V-type 4-cycle gas engine with horizontal compressor cylinders, is so perfectly balanced that only a very small foundation is required. Installation and maintenance costs are low. It is extremely flexible as to grade of fuel, speed and working conditions. Light in weight, it is readily portable over all types of oil field roads. Four sizes are available—60, 125, 190 and 260 hp., with 2, 4, 6 and 8 V-type power cylinders, respectively.

Above left: **Field installation, showing compressor and starting unit.**

Lower left: **Exterior of above compressor plant producing 8 wells in the East Texas field.**

8 Reasons why you should install this Proven Air-Gas Lift Unit:

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gas lift, the principal operators doing this work being as follows:

Humble Oil & Refining Company	534
Sinclair Prairie Oil & Gas Company	232
Stanolind Oil & Gas Company	52
Magnolia Petroleum Company	13
Gulf Production Company	8
Marathon Oil Company	7
Others	108
	954

About two-thirds of these permits were taken out in 1933, at a time when it appeared as if there might be the need for same, but a large number of the permits taken out in that year have not been exercised. In 1934, by far the major portion of the permits were taken out by Humble Oil & Refining Company, after this company had had time to investigate the advantages of using the residue gas from its gasoline plants in the Kilgore and London sections for lifting oil, and permits were being taken out by this company at intervals up to the end of the year.

Among the small plants that have been recently installed for handling a small group of wells are those of B. A. Skipper Production Company on the Clayborne lease, northwest of Kilgore, and the plants of Gulf Production Company and Snowden Oil Company at Kilgore.

Expense Factors in Air-Gas Lift Operations

The chief item of expense in connection with gas-lift operations is that of compressing the gas or air employed for lifting the oil. There is very little expense at the well after the installation is once made.

The capital expense is chiefly that of building the plant, but the nature of the operation is such that only the size of plant need be installed that is necessary for the production to be lifted at a given time. Plants can be enlarged from time to time, if, and when, the allowables are increased. Consequently, the initial cost of a gas-lift plant in the East Texas field at present need be based on lifting only the allowable of approximately 26 barrels per day. Many wells on leases now provided with gas-lift plants will flow naturally after having been started each day, consequently the cost per well for such a plant is very low, where the conditions are such that the compressor can be made to service a group of wells.

TABLE 1

Quantity of Output Gas Required to Lift One Barrel of East Texas Oil

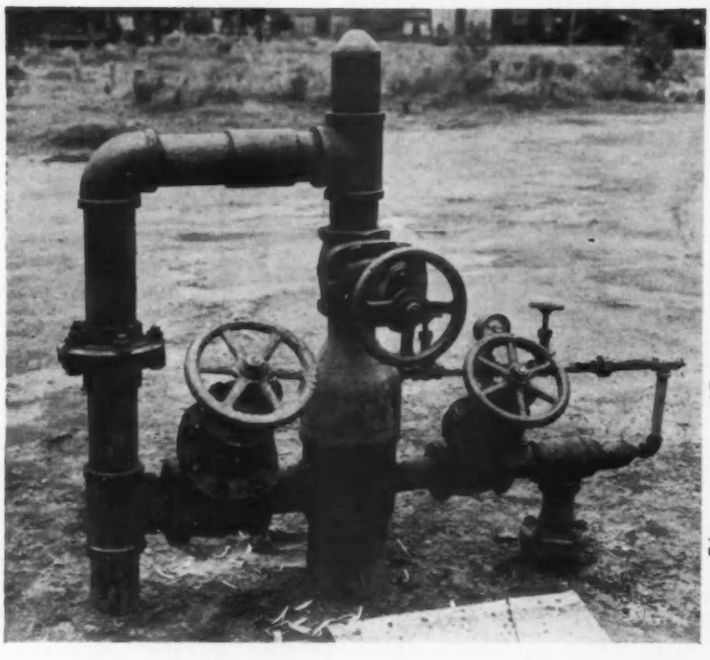
At Maximum Capacity With Given Bottom-hole Flowing Pressure

Bottom-hole Flowing Pressure Lbs. Per Sq. In.	Cu. Ft. of Output Gas Per Bbl. of Oil
1,200	10
1,000	40
800	70
600	140
500	200
400	300
300	490
200	950
100	2,650

Quantity of Gas Required to Lift the Oil

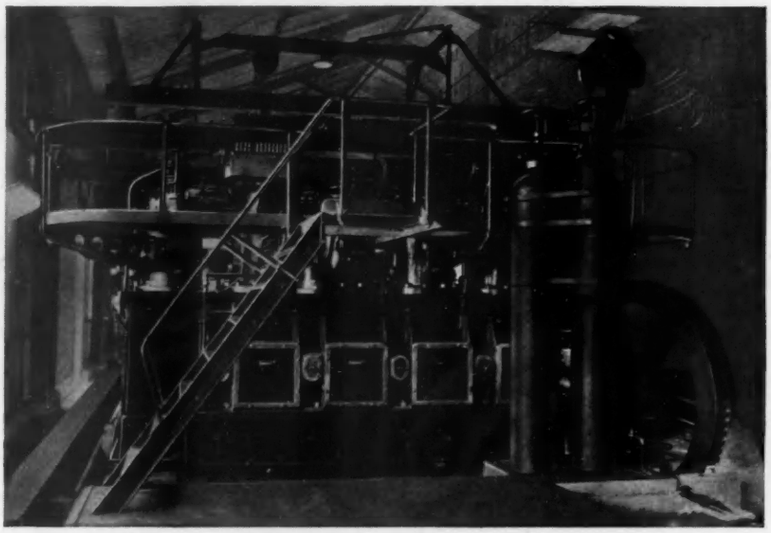
In order that an approximate idea may be had of the quantity of gas required to lift a barrel of oil in the East Texas field, the reader is referred to Table 1.[5] It will be noted in this table that the quantity of output gas appears to be low for lifting a barrel of oil. Inasmuch as there is dissolved in the oil about 370 cubic feet of gas per barrel, as long as reservoir pressures are maintained above 750 pounds,[6] if there be no water encroachment, it would seem as if natural flow conditions should continue until the flowing pressure has declined to about 400 pounds. These figures apply, however, to a discharge against no back-pressure and to continuous flowing of the well.

After a well has been shut in, the gas gradually dissociates from the oil remaining in the casing, leaving the oil in a "dead" condition. Also, it will be remembered that when water invades a well, a different set of conditions are set up, since water does not have any appreciable quantity of gas dissolved in it, and yet it must be lifted with the oil. A mixture of oil and water is more difficult to lift than either oil or water, consequently the quantity of gas required for lifting such a mixture is greater than would be the case for oil alone. Under these conditions it will probably be found that after the reservoir pressure has declined to 800 or 900



A gas-lift well of Snowden Oil Company at Kilgore. About 300 pounds pressure is necessary to kick off the well.

—so it is TODAY at KILGORE-TEXAS



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pounds it will be impractical to depend on natural flow for producing the oil.

We may ask whether production of gas with oil not required for the lifting operation is not wasteful, and why we produce 370 cubic feet of gas with each barrel of oil when the flowing pressure is 1200 pounds, since only 10 cubic feet of gas is needed for the lifting operation under this pressure (see Table 1). This arises from the fact that 370 cubic feet of gas is dissolved in a barrel of oil and cannot be dissociated from it until the pressure is reduced to 750 pounds, consequently all the dissolved gas enters the well with the oil and the excess of 360 cubic feet must escape with the oil and, therefore, is wasted so far as its lifting power is concerned.

There has been approximately 700,000,000 barrels of oil extracted from the East Texas field under reservoir pressure in excess of 1200 pounds. This would mean that there was an excess production of about 250 billion cubic feet of gas, none of which was required for lifting the oil at this pressure, nor was it needed for moving the oil to the well if water drive is as effective as is supposed to be the case. According to calculations of Lindsly[6], very little of this dissolved gas serves the purpose of expanding and moving oil through the sand as long as the gas is dissolved in the oil, since Lindsly's figures would indicate that expansibility of gas in a dissolved condition has very slight effect in increasing the volume of liquid.

A good deal of misunderstanding arises over this subject of "wasted" gas in connection with the production of oil from all fields, in that the production of the major part of the gas considered as "wasted" occurs in the early life of the field when the gas is dissolved in the oil and cannot be separated from it in the production operation, even though a much lower quantity is required to lift the oil. It is similar to the lifting of salt water; the water cannot be lifted without also bringing out the salt with it.

It may be noted by inspecting Table 1, that in a comparatively shallow field, such as East Texas, the quantity of gas necessary to be furnished by a compressor plant is rather low, even when a low pressure is employed, if the gas is applied in the most efficient manner. When requiring a small quantity of gas per barrel lifted, it follows that the cost of the compressor plant is lower than when a large quantity of gas is required. For instance, the quantity of gas required in East Texas to lift a barrel of oil by continuous flow under flowing pressure of 100 pounds, is 2650 cubic feet as compared with 6400 cubic feet required for lifting a barrel of oil in the Oklahoma City field under the same flowing pressure.

Conditions Affecting Gas-Lift Operations

The application of gas-lift for lifting oil is far from being standardized, but the trend is gradually approaching that direction. There are various methods required in different fields, depending on the condition existing in those fields. The conditions affecting to an important extent the lifting of oil by gas-lift are as follows:

1. Length, diameter, and character of the surface of the flow pipe.
2. Pressure at the lower end, and at the upper end, of the flow pipe.
3. Quantity, density, viscosity, and temperature of the oil.
4. Quantity and temperature of the gas, and also to a minor degree, the density and viscosity of the gas.

One of the most important factors is that of the length of the pipe, which is, of course, directly dependent on the depth of the well. As compared with many of the fields in which the gas-lift has been employed in recent years, the East Texas field is shallow, thereby requiring less energy to lift the oil, and, therefore, in reducing the expense of the operation. Also, the pressure in the East Texas field has been high, and may continue to be high for a considerable length of time. High-flowing pressures and relatively shallow wells make for low quantity of gas required to lift the oil.

In order to permit lifting the maximum quantity of oil, and to reduce the lifting expense to a minimum when the well has declined to a low point, various modifications of the gas-lift are employed. These modifications may not require serious changes in the compressor plant, but they do affect the manner in which the gas is applied at the well.

The stages at present through which the gas-lift is recognized as passing when flowing a well over a long period of time are as follows:

1. Natural flow.
2. Continuous gas lift, including periodic flowing.
3. Intermittent flow.

Natural Flow. Unquestionably the most satisfactory and least expensive lifting method is that of natural flow, and it is usually desirable to continue this method for as long a period as the oil will flow in satisfactory quantity. Natural flow is gas-lift flow[4], in which the gas associated with the oil is the lifting medium. The handling of natural flow to best advantage involves use of the proper size of flow pipe, and use of the proper back-pressure, etc., in order that it may function in the most satisfactory manner. This method is that mostly in use in East Texas at the present time.

Periodic Flow. Periodic flow may be applied to natural flow or to artificial gas-lift flow. This method is employed when, for reasons of restricting production, it is necessary to produce only a small part of the well's potential. The well, in this case, is opened to production each day and flowed until the allowable for the day is obtained, when it is again shut in. This adaptation of continuous or "straight" flow is that employed in the East Texas field at the present time where gas-lift is employed but is used periodically.

Continuous Gas-Lift. Where the capacity of the well is high, after natural flow has ceased, the use of continuous flow is that mostly employed, particularly when it is desired to extract large production. At such times, the flowing pressures are yet relatively high and consumption of input gas from the plant is low. Again, in continuous flow, the use of the proper size of flow pipe, tubing, etc., is of vital importance, if the operator wishes to obtain the best results.

Examples have been noted in the East Texas field* of wells operated at 250 to 300 pounds input pressure with average input ratio of 500 cubic feet of gas per barrel of oil. A well making only five barrels per day has been operated at 300 pounds input pressure and with input factor of 3000 cubic feet per barrel;

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THE YOUNGSTOWN STEEL PRODUCTS CO., Dashwood House, Old Broad Street, London, E. C. 2, England

and another well making three barrels per day is produced with input factor of 6000 cubic feet per barrel.

Starting valves, and tubing collars with holes drilled in them, are being used to considerable extent when flowing through the tubing, as this reduces the pressure at which the well can be started when opened up each day. Input ratios in the East Texas field as low as 200 cubic feet per barrel are cited even when producing 25 percent water by this method[4].

Gas-lift and starting valves have been employed for bringing new wells into production, by first running tubing equipped with these valves, then displacing the water with oil, and then flowing the oil through the tubing with gas-lift[4].

Intermittent Flow. Intermittent flow is employed after the capacity of the well is relatively low, and when the consumption of gas on continuous gas-lift rises to a comparatively high point. It has been found that by intermitting, in relatively small wells, a larger production can be obtained each day, and the quantity of gas necessary for lifting the oil is reduced below that required on continuous flow.

The methods of intermittent flow that might be applied to advantage under certain conditions in the East Texas field are as follows:

1. Use of one string of tubing, and producing through the tubing.

2. Use of two strings of tubing, with chamber and starting valve at the lower end of the outer tubing. Production is through the inner string of tubing.

3. Use of casing without standing valve through which to flow the oil, introducing the gas through the tubing.

4. Use of casing, provided with packer and standing valve, through which to flow the oil.

5. Use of plunger-lift, in which the production is through the tubing.

The conditions under which intermitent flow would need to operate, as regards pressure, permeability of the sand, and authorized allowables, will govern the method to be used to greatest extent, but they cannot be foretold at the present time.

Compressor-Plant Consideration

The output gas from wells in the East Texas field contains sufficient gasoline[7] to make its extraction profitable, particularly with a fair price for natural gasoline, consequently some of the larger companies in the East Texas field are likely to install plants equipped with large sizes of compressor units, consisting of 165 to 230 horsepower or even larger. It is logical to expect that these companies will attempt to combine their gas-lift production with the gasoline-extraction operations in the same central plant.

The situation of the smaller companies is quite different, however, and it would seem as if the use of small compressor units, ranging from 50 to 100 horsepower would be in demand for gas-lift work, where gasoline extraction would be a minor consideration. These small plants can be erected, starting with one small unit, costing from $2,500 to $8,500 at the present time[8], and would service several wells.

The size of the small plant would be increased as occasion demands greater capacity for handling larger quantities of oil, if the allowable should be increased in the future. The changes necessary in case a plant is increased would be confined almost entirely to the plant. The equipment and hook-up at the wells in such cases need not be disturbed in any way, if the lay-out at the beginning is properly made.

In connection with handling restricted production on gas-lift in such fields as East Texas, Foley[4] states that "gas-lift is the most natural of the artificial means of producing oil. It may be used economically under restricted production, especially in connection with gasoline plants. Many wells which are now being equipped for gas-lift will be produced to depletion by that method. It is possible that under restricted production, gas-lift may be assuming its proper role and achieving its greatest usefulness in the oil industry."

References

[1]S. F. Shaw. When Will East Texas Wells Stop Flowing. The Oil Weekly, December 19, 1932.

[2]D. G. Hawthorne. Subsurface Pressures in Oil Wells and Their Field of Application. Trans. A.I.M.E. Pet. Dev. & Tech., 1935, p. 148.

[3]S. F. Shaw. Air-Lift Methods and Costs in East Texas Field. Petroleum Reporter, October, 1934.

[4]L. L. Foley. Gas-Lift and Restricted Production. Paper read at meeting of the A.I.M.E. at Tulsa, October, 1934.

[5]S. F. Shaw. Air-Lifting Oil to Take Advantage of Existing Pressures in East Texas. The Oil Weekly, July 9, 1934, p. 19.

[6]Ben E. Lindsly. A Study of Bottom-Hole Samples of East Texas Crude Oil. Paper read before the American Petroleum Institute at Tulsa, May 18, 1933.

[7]G. H. L. Kent. Intermittent Production Cuts East Texas Natural Gasoline Yield from 5 to 2 G.P.M. National Petroleum News, May 18, 1932.

[8]S. F. Shaw. Compressor-Equipment Cost for Gas-Lifting in Mid-Continent Depends on Conditions. The Oil Weekly, October 8, 1934. p. 25.

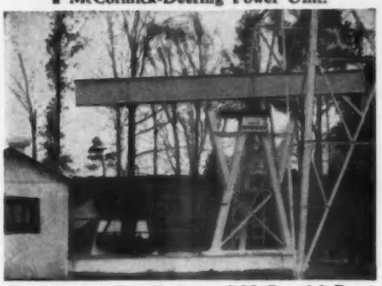
Wells Using Air or Gas Lift in East Texas Field

OPERATOR	Lease	Survey	Well No.	Date
Adams & Lyles	Kersh	Faults	1	2-15-34
American Liberty	Frederick	Ximines	1	9-30-33
American Liberty	Sabine, R.	State Land	All trs.	6-26-33
Arrow Refining Co.	Warren, S. A.	Wommack	1	3-29-34
Burwyn Oil Co.	Smith, Mary	Miller	1 & 2	6-13-34
Carey, A. P.	Redwine, "A"	Pena & Xim.	2	8-14-33
Chicago Oil Co.	Alford	Moore	1 & 2	12-17-34
Davis, Roy	School Lot	Ferguson	1	10-16-33
Fair, et al	Deason, A.J. & D.F.	Ximines	1 & 2	7- 3-33
Fair & Thompson	Bradford	Ximines	1	7- 3-33
Farrell & Co.	Brox	Grace	1 & 2	6-27-33
Gold Star Oil Co.	Butts	Van Winkle	1	3-14-33
Gulf Prod. Co.	Batton, O. R.	Cogswell	1	.....
	Culver, et al	Van Winkle	5	.....
	Still, C. L.	Wilkinson	1	5-18-34
	Still, C. L.	Wilkinson	2	4-19-34
	Still, C. L.	Wilkinson	3	11-30-34
Gulf Production Co.	Still, C. L.	Wilkinson	4	11-10-34
	Still, R. H.	Wilkinson	4	.....
(Dead)	Turner, G. G.	Cordova	7	2-20-33
Humble Oil & Ref. Co.	Alexander	Smith	1	11-15-33
	Alexander	Smith	3	1-13-34
	Alexander	Smith	4	9-20-34
	Alexander	Smith	5 & 6	11-24-34
	Alexander	Smith	7	1- 3-35
	Arnold, J. E.	Smith	1, 2 & 3	7- 3-33
	Arnold, J. E.	Smith	6	9-20-34
	Arnold, J. E.	Smith	5	1- 3-35
	Arnold, J. H.	Hollingsworth	4	8-16-34
	Barksdale, "A"	Hollingsworth	1	7- 3-33
	Barksdale, "B"	Martin	2	5-10-34
	Barksdale, "B"	Martin	3 & 4	8-16-34
	Barksdale, "B"	Martin	5, 6 & 8	11-24-34
	Barksdale, "B"	Martin	7	1- 3-35

(*Continued on page* 48)

For Economy.... specify McCORMICK-DEERING POWER

Power for pumping this well is supplied by a McCormick-Deering Power Unit.



One of many installations of McCormick-Deering Power in East Texas. The power unit is inside the shed.

The Elsep Oil Company employs McCormick-Deering to pump its Mattox well No. 1.

The Arcadia Refining Company depends on McCormick-Deering Power for this outfit at Gladewater, Texas.

When the industry turned to multi-cylinder engines for pumping wells McCormick-Deering Power Units were among the very first to go on the job. They proved their economy in such convincing fashion that they are fast becoming standard power for pumping. Their wide power range combines with modern installations to cover practically every power requirement in the field. They are backed by International Harvester's more than 30 years of experience building engines, and by the network of distribution and service maintained by International Harvester. For complete information on McCormick-Deering Power Units ask the nearest branch or distributor.

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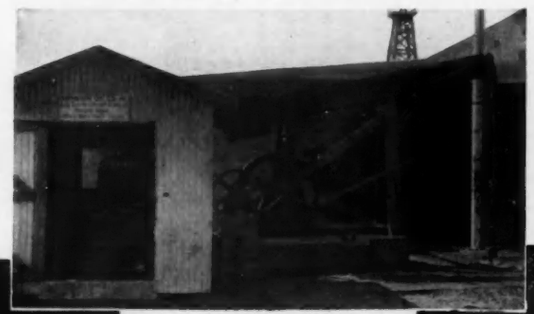


Above: A McCormick-Deering Power Unit provides power for the Snowden Oil Co., Inc., on the Kelly Dickson lease at Kilgore, Texas.

At left: A 6-well hookup powered by McCormick-Deering for De Arman & McMillen, Sexton City, Texas.

This McCormick-Deering Power Unit pumps three 3700-foot wells and pulls 1000 feet of surface rod for Rogers Lacy near Kilgore, Tex.

A McCormick-Deering Power Unit working on the Lulu May Baker lease at Johntown, Texas.

Typical of McCormick-Deering installations is this unit at work near Reed Switch, Overton, Texas.

Another pumping outfit in East Texas operated by a McCormick-Deering Unit.

McCORMICK-DEERING INDUSTRIAL POWER

Wells Using Air or Gas Lift in East Texas Field—Continued

OPERATOR	Lease	Survey	Well No.	Date
Humble Oil & Ref. Co..	Barton, T	Grace	1, 2 & 3	7- 3-33
	Barton, T	Grace	4 & 5	11-24-34
	Barton, T	Grace	6	1- 3-35
	Box, J. R.	Martin	1 to 11	7- 3-33
	Box, J. R.	Martin	12 to 18	11-24-34
	Brightwell, C. A.	Martin	1 to 4	7-3 -33
	Brightwell, C. A.	Martin	5 & 6	5-10-34
	Cameron, R. T.	Martin	1, 2 & 3	7-3 -33
	Cameron, R. T.	Martin	4	5-10-34
	Cameron, R. T.	Martin	5	8-16-34
	Crim, L. D.	Seviere	73, 4	7-30-33
	DeGuerrin	Martin	1	7- 3-33
	Dennis, Sol.	Melton	5	7-20-33
	Dennis, Sol.	Melton	6 & 7	11-24-34
	Elliott, J. R.	Martin	1	7- 3-33
	Elliott, J R.	Martin	2	11-24-34
	Grambling, R. P.	Act. No. 1	1 to 4	8-16-34
	Glover, J. E.	Martin	4	9-30-33
	Glover, S. A.	Smith	1, 2 & 3	7- 3-33
	Glover, S. A.	Smith	4	2-18-33
	Glover, S. A.	Smith	5	5-10-34
	Glover, S. A.	Smith	6	8-16-34
	Glover, S A.	Smith	7	11-24-34
	Hedges, G. H.	Barnett	1	12-16-33
	Holt, Ida. "C"	Bears	1 to 9	7- 3-33
	Holt, Ida "C"	Bears	10	11-24-34
	Holt, Ida "C"	Bears	11-12-13	1- 3-35
	Laird, S. A. "A"	Ruddle	1 to 4	7- 3-33
	Laird, S. A. "A"	Ruddle	5	7-20-33
	Laird, S. A. "A"	Ruddle	6 to 12	7- 3-33
	Laird, S. A. "A"	Ruddle	13	7-20-33
	Laird, S. A. "A"	Ruddle	14	7- 3-33
	Laird, S. A. "A"	Ruddle	15	5-10-34
	Laird, S. A. "A"	Ruddle	16 to 21	7-3 -33
	Laird, S. S. Act A.	Ruddle	22 to 25	5-10-34
	Laird, S. S. Act. A.	Ruddle	26	9-30-32
	Laird, S. S. Act. A.	Ruddle	27	8-16-34
	Laird, S. S. Act. A.	Ruddle	28-30	11-24-34
	Laird, S. S. "B"	Lewis & Van W	1 to 11	7- 3-33
	Laird, S. S. "B"	Lewis & Van W	12 to 24	7- 3-33
	Laird, S. S. "B"	Lewis & Van W	25	9-30-33
	Laird, S. S. "B"	Lewis & Van W	26 & 27	7- 3-33
	Laird, S. S. "B"	Lewis & Van W	28 & 30	5-10-34
	Laird, S. S. "B"	Lewis & Van W	32 to 34	5-10-34
	Laird, S. S. "B"	Lewis & Van W	35	7- 3-33
	Laird, S. S. "B"	Lewis & Van W	36 to 49	5-10-34
	Laird, S. S. "B"	Lewis & Van W	50 to 59	8-16-34
	Laird, S. S. "B"	Lewis & Van W	60 to 62	11-24-34
	Laird, S. S. "B"	Lewis & Van W	63	1- 3-35
	McDavid	Smith	1	9-30-33
	Mulliken	Martin	1 to 13	7- 3-33
	Mulliken	Martin	14	5-10-34
	Mulliken	Martin	15 to 16	8-16-34
	Mulliken	Martin	17 to 18	11-24-34
	Neal	Smith	1 & 2	2-18-33
	Neal	Smith	4	9-20-34
	Neal	Smith	5	11-24-34
	Neal	Smith	3	1- 3-35
	Naulls	Martin	1 to 5	7- 3-33
	Naulls	Martin	6 & 7	8-16-34
	Naulls	Martin	8	1- 3-35
	Peterson, Ben	Lewis	1-2-3	7- 3-34
	Peterson, Ben	Lewis	4	5-10-34
	Peterson, Ben	Lewis	5	8-16-34
	Peterson, W. D.	Lewis	1 to 5	7- 3-33
	Peterson, W. D.	Lewis	6	5-10-34
	Peterson, W. D.	Lewis	7 to 10	8- 6-34
	Pilgreen, C	Barton	1 to 9	7- 3-33
	Pilgreen, C.	Barton	10	5-10-34
	Pilgreen, C	Barton	11 to 13	11-24-34
	Pilgreen, C.	Barton	14	1- 3-35
	Pittner	Martin	1 to 5	7- 3-33
	Pittner	Martin	6 to 8	5-10-34
	Price	Melton & Scott	1 to 28	7- 3-33
	Price	Melton & Scott	29 to 32	5-10-34
	Price	Melton & Scott	34 to 35	5-10-34
	Price	Melton & Scott	36	8-16-34
	Price	Melton & Scott	37 & 38	5-10-34
	Price	Melton & Scott	40 to 43	11-24-34
	Price	Melton & Scott	45	11-24-34
	Reid	Martin	1 to 5	7- 3-33
	Reid	Martin	6 to 7	8-16-34
	Robertsen, J. T.	Grace	1 to 4	7- 3-33
	Robertson, M.	Cooper	1 to 3	7- 3-33
	Robertson, M.	Cooper	4 & 5	11-24-34
	Robertson, O.	Clark	1 & 2	7- 3-33
	Scott	Bears	1 & 2	7- 3-33
	Scott	Bears	3	1- 3-35
	Sexton, H. "A"	McCabe	1 to 8	7- 3-33
	Sexton, H. "A"	McCabe	10	11-24-34
	Sexton, H. "B"	McCabe	1 to 17	7- 3-33
	Sexton, H. "B"	McCabe	18 to 23	8-16-34
	Sexton, H. "B"	McCabe	24 & 25	9-20-34
	Sexton, H. "B"	McCabe	26	1- 3-35
	Sexton, J. E. "A"	McCabe	1 to 5	7- 3-33
	Sexton, J. E. "A"	McCabe	6	8-16-34
	Sexton, J. E. "A"	McCabe	7	5-10-34
	Sexton, J. E. "B"	McCabe	1 to 5	7- 3-33
	Sexton, J. E. "B"	McCabe	6	11-24-34
	Sexton, J. T. "A"	McCabe	1 to 8	7- 3-33
	Sexton, J. T. "A"	McCabe	9 to 11	8-16-34
	Sexton, J. T. "A"	McCabe	12 to 14	9-20-34
	Silvey, R. E. L. "A"	Martin	1 to 29	7- 3-33
	Silvey, R. E. L. "A"	Martin	30 to 35	5-10-34
	Silvey, R. E. L. "A"	Martin	37 to 45	8-16-34
	Silvey, R. E. L. "A"	Martin	46	11-24-34
	Silvey, R. E. L. "A"	Martin	48 & 49	1- 3-35
	Simmons	Bears	1 & 2	7- 3-33
	Simmons	Bears	3	11-24-34
	Simmons	Bears	4	1- 3-35
Humble Oil & Ref. Co..	Smith, M. "A"	Martin	1 & 2	7- 3-33
	Smith, M. "A"	Martin	3	8-16-34
	Smith, M. "B"	Miller	1	7- 3-33
	Smith, M. "B"	Miller	2	5-10-33
	Turner, J. W.	Melton	1 to 17	7- 3-33
	Turner, J. W.	Melton	18	8- 6-34
	Turner, J. W.	Melton	19 & 20	5-10-34
	Turner, J. W.	Melton	22	5-10-34
	Turner, J. W.	Melton	27 to 29	8-16-34
	Turner, J. W.	Melton	30 to 33	8-16-34
	Turner, J. W. "B"	Anderson	1	8-16-34
	Watkins, M.	Miller	1	7- 3-33
	White, H. "A"	Scott	1 to 3	7- 3-33
	White, H. "A"	Scott	4	8-16-34
	White, H. "A"	Scott	5	1- 3-35
	White, H. "B"	Scott	1 to 8	7- 3-33
	White, H. "B"	Scott	9	5-10-34
	White, H. "B"	Scott	10 to 13	8-16-34
	White, H. "B"	Scott	14	11-24-34
	White, H. "B"	Scott	15	1- 3-35
	White, J.	Scott	1 to 3	7- 3-33
	White, J.	Scott	4	8-16-34
	White, J.	Scott	5	1- 3-35
	Williams	Martin	1 to 5	8-16-34
	Wilson, C. W.	Martin	1 to 5	7- 3-33
	Wilson, C. W.	Martin	6	5-10-34
	Wilson, C. W.	Martin	7 & 9	8-16-34
	Wilson, C W.	Martin	8	11-24-34
	Wooley, J.	McCabe	1 to 6	7- 3-33
	Wooley, J.	McCabe	7 to 9	11-24-34
	Wooster, F. E.	Bears	1 to 5	7- 3-33
	Wooster F. E.	Bears	6	11-24-34
	Wooster, F. E.	Bears	7 & 9	1- 3-35
	Wooster, M.	Bears	1 to 6	7- 3-33
	Wooster, M.	Bears	7	5-10-34
Humphries, T. D.	Branson	Meredith	1 to 4	12-31-34
	Dunbar, G. W.	Simpson	1 & 2	12-31-34
	Johnson	Davidson	1 to 3	12-31-34
	Spear	Van Winkle	2-3-5-8	2-15-34
	Thomas	Rodger	1 to 4	12-31-34
Koberg, et al	Blackman	Chism	1	6- 5-34
Lacey, Roger	Beal, B.	Van Winkle	2	2-15-34
Lester & Duffield	Jones	King	1 to 3	7-20-33
Lone Star Oil Co.	Griffin	Van Winkle	1	3-14-33
Magnolia Pet. Co.	Caldwell	Ruddle	1 to 6	7- 3-33
	Fisher	Ruddle	1 to 6	7- 3-33
	Fuller	Sanches	1	7- 3-33
Marathon Oil Co.	Graham, C. L. (1)	Tipps	6	5-15-34
	Grissom	Roan	77	12- 1-34
	Kangerga Bros. (1)	Tipps	5	7-10-33
	Sharps	Coy	17	5-15-34
	Sharps	Coy	21 & 22	4-15-34
	Van Zant	Sparks	4	12- 1-34
Midway Pet. Co.	Lawthors	Moffitt	1 to 4	6- 9-34
	Lawthors	Moffitt	5	1- 3-35
Molly Oil Co.	Heroines of J.	Bradshaw	1 & 2	.....
Moore, B. W.	Folts Blk. 117	VanWinkle	1	3- 8-34
Moss, H. S.	Marshall	Van Winkle	10	1- 3-35
Ortis Oil Co.	Hale	Moore	4	2-15-34
Potter, Tom	Anderson	Van Winkle	1	9-25-34
	Baker	Van Winkle	1	9-25-34
Reserve Dev. Co.	Fuller	Sanches	1 & 2	7- 3-33
Sinclair-Prairie	Bradford	Ximines	1 & 2	8-23-33
	Grissom	Porter	1 & 2	8-24-33
	Grissom	Porter	4	8-24-33
	Holland	Ximines	1 to 10	8-23-33
	Jarvis, A. S. "A"	Vargas	1 to 19	8-23-33
	Jarvis, A. S. "C"	Coy	1 to 17	8-23-33
	Jarvis ,A. S. "B"	Vargas	1 to 8	8-23-33
	Kersh	Faults	1-2-5-6	8-23-33
	Kinney, W. D.	Cadena	1 to 36	8-20-33
	Ledbetter	White	1 to 15	8-23-33
	McCord	Cadena	1 to 5	8-23-33
	Mayfield "A"	Jordan	1 to 22	8-23-33
	Mayfield "B"	Cadena	1 to 5	8-23-33
	Mayfield "B"	Cadena	7 to 9	8-23-33
	Moore	Vargas	1-2-3-5-6	8-23-33
	Patterson	Vargas	1 to 5-7	8-23-33
	Tipps, Peter "A"	Poindexter	1 to 7 10 to 12	8-23-33
	Tipps, Peter "B"	Poindexter	5-8-9	8-23-33
	Wylie, K. Amanda	Jordan	1 to 9	8-23-33
	Wylie, Jack	Jordan	1 to 3	8-23-33
	Wilson, Bunch	Jordan	1 to 8	8-23-33
	Wilson, F. B.	McAnulty	1 to 8	8-23-33
	Wilson, J. B.	McAnulty	1 to 7	8-23-33
	Wright, Bobby	Vargas	1	8-23-33
	Wright, Ethel	Vargas	1	8-23-33
	Wright, Dora	Vargas	1 to 12	8-23-33
	Wright, R. G.	Vargas	1 to 8	8-23-33
	Wright, R. G.	Vargas	1	8-23-33
Skipper, B. A. Prod.	Clayborne "B"	Baty	2	9-25-33
	Warlick	Baty	1	9- 4-34
Snowden, H. W.	Alexander	Van Winkle	1	8-15-34
	Parks	Van Winkle	1	8-15-34
	Florence	Van Winkle	1 to 3	8-15-34
	Gelber	Van Winkle	1	8-15-34
	King	Van Winkle	1 & 2	8-15-34
	Utzman	Van Winkle	1	8-15-34
Southport Pet. Corp	I & G N Tr. 1	Van Winkle	1	6- 2-34
	I & G N Tr. 2	Van Winkle	1	5-31-34
Stanolind Oil & Gas	Siler	White-Walker	1 to 52	1-18-33
Turnbow, W. C.	Heard	Van Winkle	1	2-15-34
	Knowles	Van Winkle	1	2-15-34
Welch-Sander Oil Co.	Barnett	Johnson	1 to 6	8-14-33
Wells & Gann	Johnson	Van Winkle	1 & 2	2-15-34
Wilson, W. H.	Terrell	Sevier	1	10-16-33
Wright-Smith Oil Co.	Griffin	Van Winkle	1	3-14-33
	Harris	Van Winkle	2	3-14-33

Legend* Where numbers read 1 to 12, etc., it means inclusive of 1 and 12.

We've made it EASY and SAFE for you

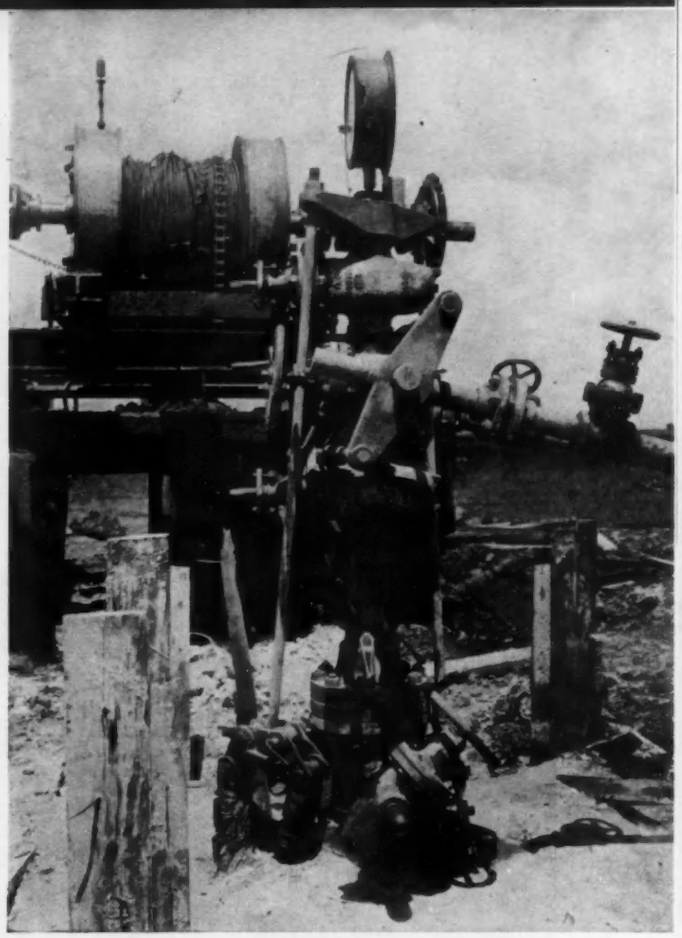
O-C-T TYPE T-3 TUBING HEAD

Here's a tubing head which solves an outstanding well problem of today . . . and tomorrow.

It allows you to keep heavy drilling mud off the oil bearing sand by allowing you to drill in with oil or clear water, and do so with utmost safety. The mechanical excellence of this design completely offsets the one-time hazard of completing a well with light weight fluids in the hole. You can easily and safely drill in and run tubing against pressure and wash behind the liner, as many joints up as desired. The slips on which tubing suspends can also be used for running tubing.

The illustrations below tell the story: Fig. 1 shows tubing set, the head employing a single packing unit. Fig. 2 shows tubing in running position, against two packing units. As many of these packing units can be employed as the job requires, building one unit upon the other merely by adding an extra bowl and packing unit. Fig. 3 presents still another safety factor about this head design; the O-C-T Type "H" Blowout Preventer fits on top of the head.

Let an O-C-T representative show you the advantages to be gained by using this revolutionary head.



A Type T-3 head on a recently completed Mykawa, Texas, well, installed after the well had "kicked" while drilling. No further trouble developed following installation of this head, and the well was completed with perfect control.

Selling Through Supply Stores

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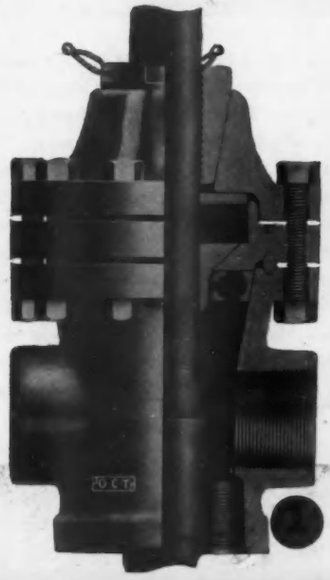
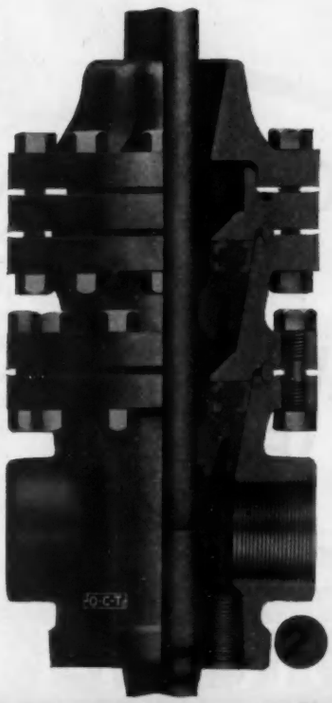
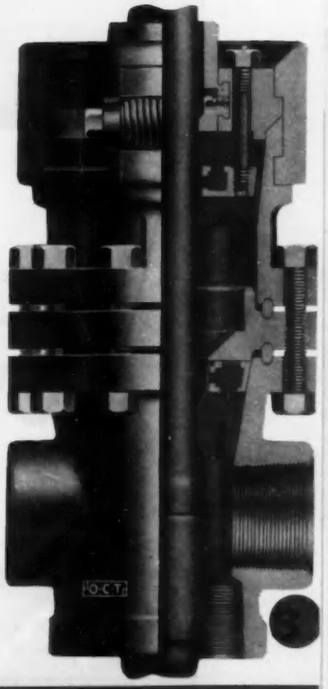
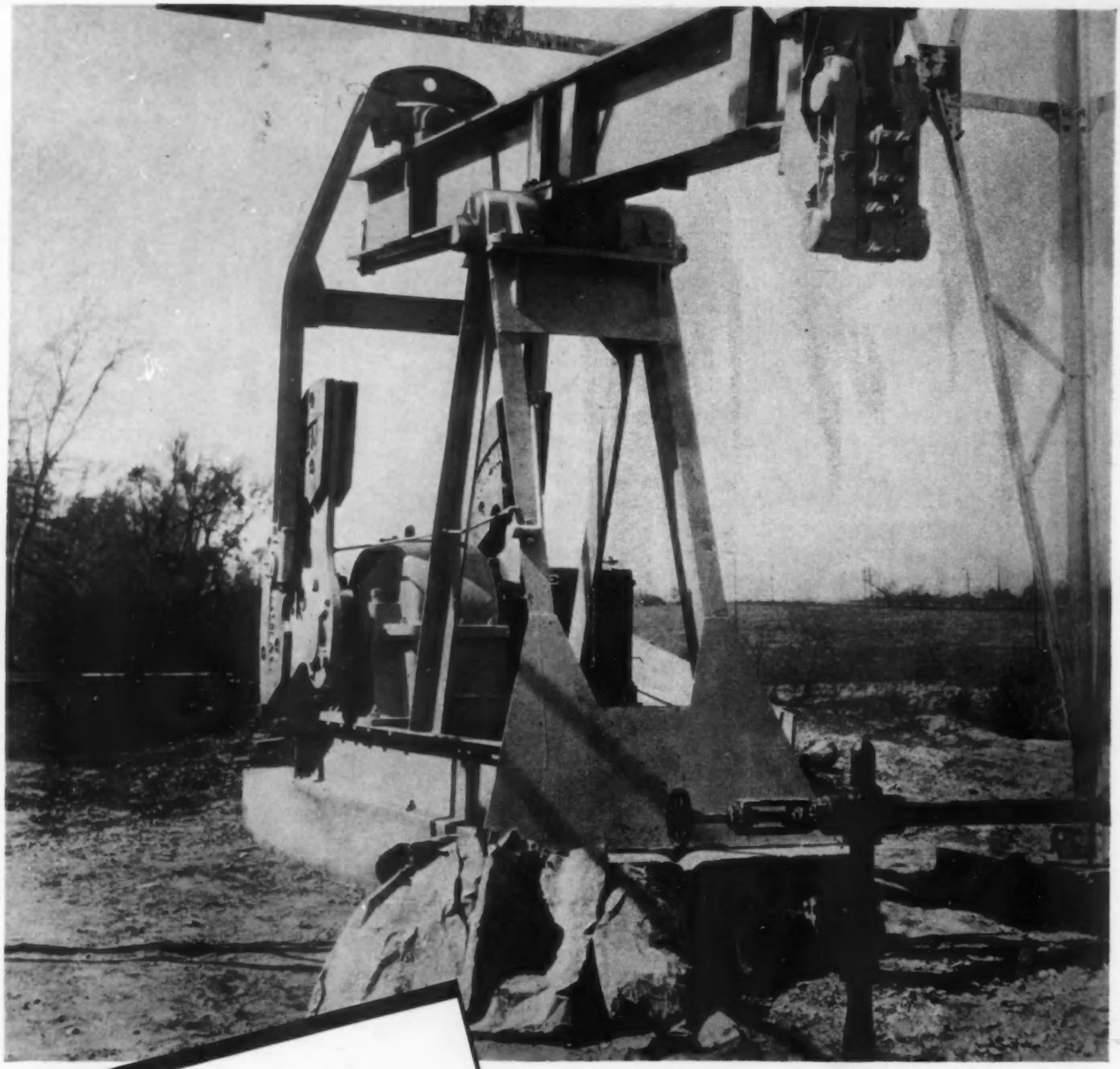
CABLE ADDRESS "OCEANTOOL"







to DRILL IN AGAINST PRESSURE



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WHEN a well comes in a pumper it pays to use 'Incor' concrete. Example: Frances Oil Company's Scroggin No. 4, near Kilgore, Texas, where National Supply Construction Co. installed pumping unit (above). 'Incor' was placed Friday noon; well was on the pump Sunday noon. Foreman Inman, who supervised the job, says 'Incor' brought this 100-barrel well into production 10 to 12 days sooner than possible with ordinary Portland cement. It cost $3.15 more to use 'Incor'*—but it meant real money—1000 or 1200 extra barrels of oil. Typical of many oil-field advantages of this better Portland cement. Made and sold by producers of Lone Star Cement, subsidiaries of International Cement Corporation, New York; also sold by other leading cement manufacturers.

*Reg. U. S. Pat. Off.

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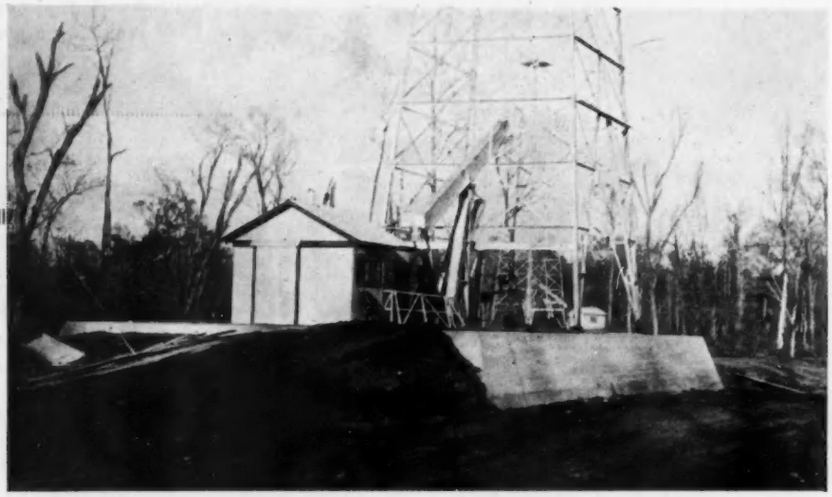


Concrete used as a precautionary measure in the Sabine River bottom. The retaining wall is approximately eight feet high.

Pumping Foundations

OF PROPER DESIGN TO MEET FOUR PRIME REQUIREMENTS ARE ECONOMIES

By DEWEY T. ROSS
Dewey T. Ross, Inc.
Consulting Engineers and Contractors
Tyler, Texas

ITEMS of prime importance for consideration in the installation of any pumping equipment are:

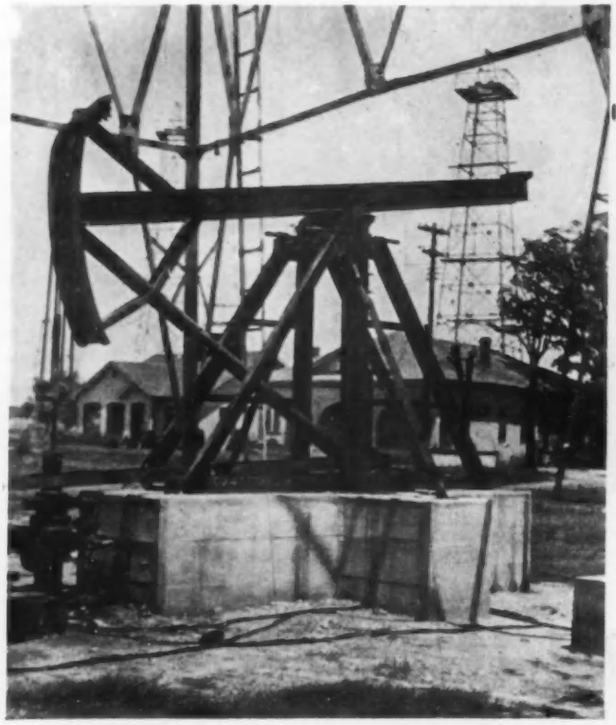
1. Bearing power of soil, or investigation of earthen foundation.
2. Most economical and practical orientation of equipment.
3. The required mass or weight of the foundation.
4. Strength of the foundation and the future use of the equipment.

Soil conditions in the East Texas field vary from one location to the offset location, and as central power plants are for an entire lease or at least several wells, and are, consequently, farther apart, this change is more likely to obtain. Due to this change in the bearing quality of the soil, there are no fixed sizes for the foundations of the various pieces of equipment. A minimum mass and thickness of concrete may be predetermined in the office without the knowledge of field conditions, however, the spread foundation that may be required to obtain sufficient bearing can only be known after examination of the soil. This soil, on which rest the concrete and equipment, is, of course, the true foundation. Hool and Kinne, in "Foundations, Abutments and Footings," set forth formulas for determining the mass of concrete required to overcome the Kenetic reactions of moving machinery, as well as proper spreads for various soils and load conditions.

While most manufacturers design a foundation for their equipment, this design is of necessity for an assumed soil condition and cannot fulfill all requirements. In setting equipment the use of an engineer generously repays his expense by determining the amount and grade of concrete, and the supervision of the mixtures, mixing and placing of the concrete. The greater saving is not in the concrete but in reducing the vibrations and lateral movement and the resulting fatigue to the component parts of the machine, excessive bearing strains and misalignment.

The orientation of equipment should be given consideration for economical and safety reasons. The pumping derrick should be so placed that the "V" is most accessible to the pulling machinery. It may even be advisable to set a pumping jack out of square with the derrick. The orientation of the jack being determined by the location of the prime mover, and the orientation of the derrick determined by natural causes, such as a creek or branch.

Economy demands that the day of eye alignment, hand-level work, guessed mixtures and haphazard placing of concrete be past. The narrow margin of profit



An example of placing well connections too high, requiring a greater amount of concrete than other considerations needed.

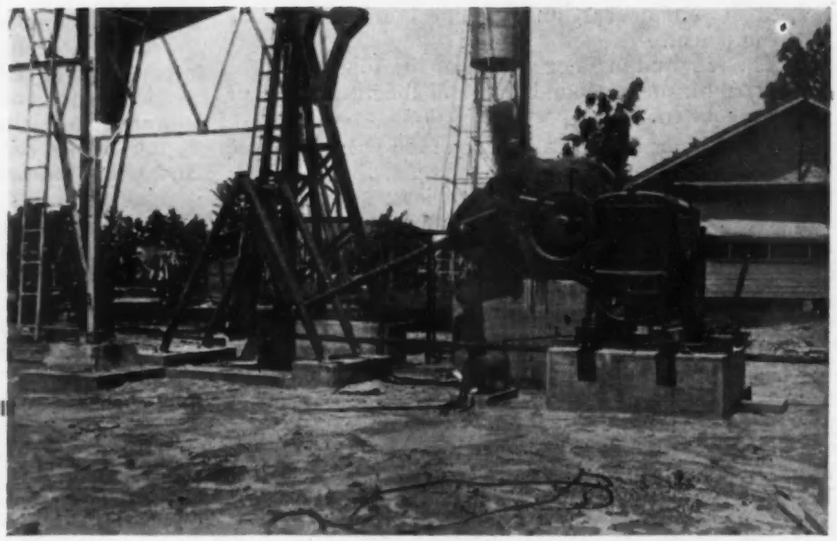
imposed on the producer, due to prevailing price of crude, warrants the initial expenditures for properly placing the foundations, leveling and setting equipment. With improved lifting methods, and mechanically- and metallurgically-bettered machinery, the life of pumping equipment has been prolonged. Further consideration as to the future usefulness, whether sold or moved, should be given. This salvage value is enhanced by proper installation and maintenance.

The use of cellars with adequate drainage is one of the most economical expenditures. We have noticed a great number of pumping jacks and unit installations where the derrick floor and cellar were omitted. This omission is no doubt caused by the desire to save the initial cost of these items. Since it is practically impossible to entirely stop stuffing box leakage, and as there is bound to be oil or fluid accumulation on the floor during the pulling of rods and tubing, the soil surrounding the foundation of the equipment becomes impregnated with this fluid. The oil follows the block and outside of the casing as the line of least resistance, thus forming a loblolly condition and greasing the under portion of the concrete block. With the pull of the rod line or the thrust imposed on the beam by crank and sucker rods the jack or unit soon becomes misaligned. This condition throws eccentric loads on members not designed to carry them, causing flecture in the polished rod, excessive wear on the stuffing box, and increasing the energy necessary to do the work. The lost production during shutdown time alone will soon pay for the small additional cost of the cellar, not to mention the cost of replacement parts and labor incident to the replacements.

Concrete Foundations

Concrete foundations are as great an advancement as the rapid pace of improvements made by manufacturers of oil field equipment. Yet it is possible to throw away the money expended for these foundations. Improper ingredients, poorly mixed, porportioned and slovenly placed, constitute a waste of effort and money. Only fresh cement should be used, as concrete is the result of chemical action of water and cement. If the cement be old, this reaction has progressed to such a state as to result in poor concrete when such old cement is used. The aggregate, both large and small, should be properly proportioned and well washed. No one would attempt to make concrete with surface dirt and cement, yet it is not unusual to see dirty aggregates used. The result can be nothing but concrete of inferior strength.

The proportioning of the mixture is highly important, and a knowledge of the proper proportion is invaluable. Where great mass is required, rather than great strength a mixture of 1:3:6 may safely be used. Examples of the use of this lean mix is the lower spread footings of great thickness for engine blocks, and similar type of footings. In a 1:3:6 mix reinforcement should be used. The upper portion of the engine block should be made



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richer, a 1:2:4 mix being the most economical proportion with safety.

This ratio gives great strength. A 1:2½:5 mix is sufficiently strong for derrick corners. The purpose of concrete derrick corners is to offset turning movement due to wind loads, therefore sufficient mass should be had to overcome these loads and hold the derrick in balance. In obtaining this mass the corner becomes much larger than would be required to merely support the structure. Therefore the richness of the mix can be reduced.

It also is possible to use a not too large quantity of native stone. These rock should be as hard and of equal strength as the concrete. The rock should be so placed, and concrete properly puddled, that a good cementing of each rock to the entire unit is the result. All voids should be thoroughly filled or weak concrete of insufficient weight is the result. The size of the block determines the size and amount of large rock used. Such rock should be kept well away from the edges of the forms to preserve the appearance of the finished work. Rock may be used in any concrete block of sufficient size where weight rather than strength is sought. When rock is used it should be placed with the supervision of engineers. This insures that rock of proper strength only is used and properly placed.

Form work is responsible for good or bad concrete. The form must be properly designed to retain its desired shape after subjected to the stress of the wet concrete. The surface of the form material should be smooth, and the joints of the form even, so as to leave a clear, smooth surface on the finished concrete. Proper spading also is essential to obtain this smooth finish and keep the large aggregate pushed back from the face of the form.

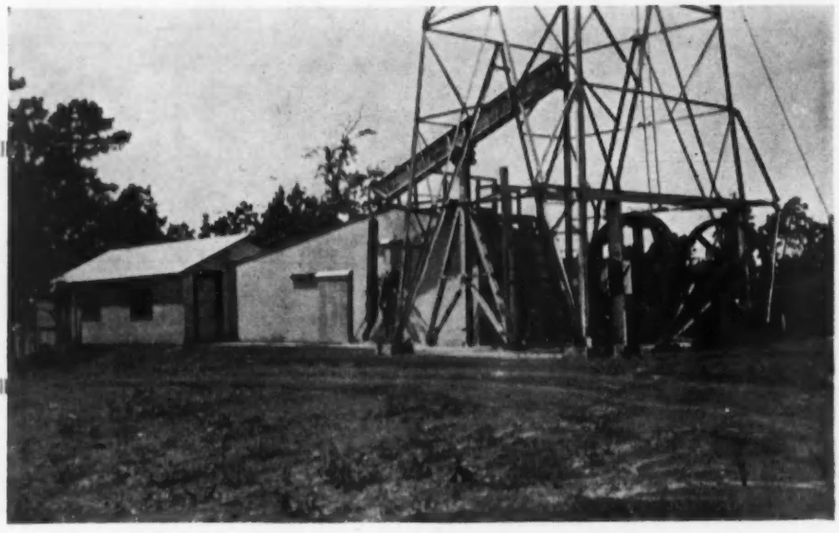
Above: An example of poorly proportioned, mixed and placed concrete. The use of too large a portion of aggregate is very evident.

The water ratio is another important item in good concrete. The water content is nearly as vital to the ultimate strength of concrete as any other factor. Cement manufacturers and associations, together with research departments of various universities, are constantly on the lookout for better methods of manufacturing cement, mixing and placing concrete, and studying the results of various admixtures and the reactions of the chemical content of water, as well as all things that make for better concrete. The engineer keeps best informed with this research through his association and trade journals, and adopts methods to increase the value, strength and economy of concrete.

The finish of concrete to some people seems to have significance; however, the ssmall additional cost of neat appearing work is money well expended. It has a psychological effect on the workman maintaining the equipment set on the concrete. Would you try to keep a piece of machinery clean that is set on a foundation which is improperly finished, and is so rough it is impossible to clean? Proper lines are essential in order that a misalignment may be visible to the eye before damage can be done to the equipment.

Placing rod line posts in concrete is small additional expenditure well worth while. This insures posts remaining vertical and at the proper elevation. As simple as rod line installation appears the service of the engineer is repaid by his knowledge of running the line to the proper curvature and thereby reducing the friction load on the rod carriers. This not only saves the carriers but reduces the required horsepower.

The manufacturers of pumping equipment have refined their product to a great degree. Most bearings are oil-bath and protected from dust. They are machined to precision and built to give the greatest service on the job for which they were designed. All the precautionary measures are for naught if the equipment is not properly set on foundations of suitable size, shape and strength as well as properly leveled and aligned. It is a waste of effort and money to purchase the best machinery and set it so that its economic life is impaired. The concrete, if properly placed, is the most valuable and cheapest portion of the pumping equipment.



Right: A standard rig front in the East Texas field with concrete floor, cellar, walkway and underground flow lines.

Announcing No. 6363 Continental-Falk Portable Pumping Unit

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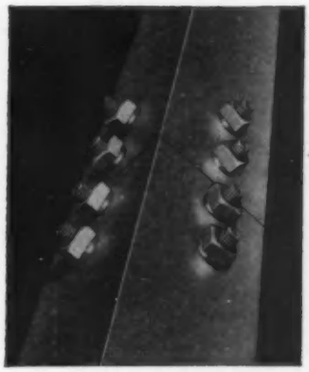
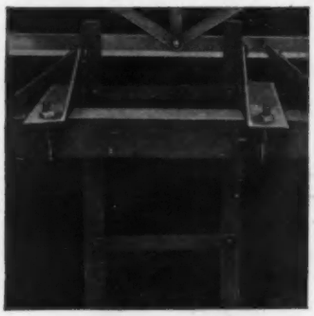
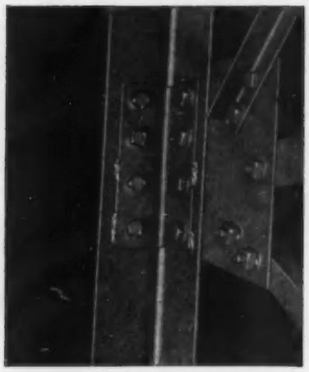
THE M.I.W. Steel Derrick



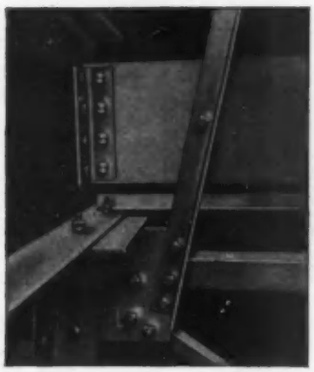
Joint with Gusset Plates removed. Bolts are galvanized, with special fin heads to prevent turning. Lock Washers are Parkerized.



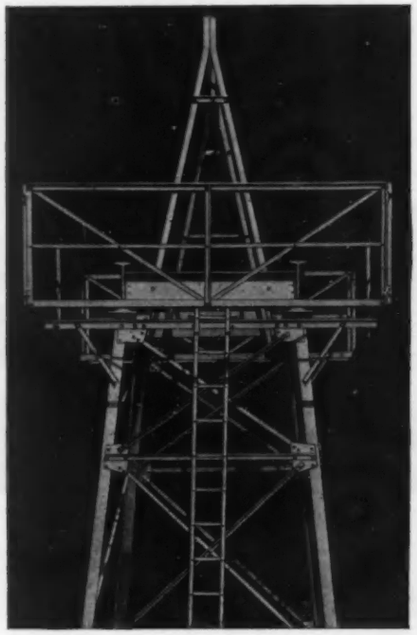
View of Ladder Connection from inside.



Inside view of Joint with one Gusset plate removed —showing how inside Splice Plate is spot-welded to leg.



View showing Gin Pole connection.



Top of M. I. W. Derrick, showing gin pole, crows nest, water table and spreaders.

Joint with one Gusset Plate removed.

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An East Texas pumping rig, powered by internal combustion engine and operating second well by means of swing shown at left.

EAST TEXAS PUMPING

Methods & Equipment

NOW INCLUDE VARIED TYPES AND DESIGNS

By BRAD MILLS, Associate Editor

THE East Texas field, with more than 17,500 producing wells, represents an interesting lifting problem for the future. Although the percentage of wells now on the pump is small, almost every type of pumping equipment may be found in daily use. Of the total number of producing wells, about 1200 are on the pump and more than 16,000 are flowing. Many of the flowing wells are rated as very weak producers, and will be placed on some type of mechanical lift in the immediate future. A large number of flowing wells are fully equipped with pumping equipment, but these 2000 to 3000 installations will remain idle so long as the wells will produce naturally. During the spring and summer of 1933, more than a dozen large operators viewed the pressure drop with alarm, and hurriedly installed pumping equipment at wells that since have shown no tendency to stop flowing. No provisions have been made for pumping the 10,000 to 12,000 flowing wells that still have a good margin of pressure and show little or no water.

Even the most optimistic operators have underestimated the flowing life of intermediate pressure wells, but many producers of ths type are showing more definite signs of passing to the pumping stage. The percentage of edge wells being completed on the pump also is greater than that of two or three years ago. Despite the great amount of oil already produced by the field, the transition to the pumping or mechanical lift stage will be gradual.

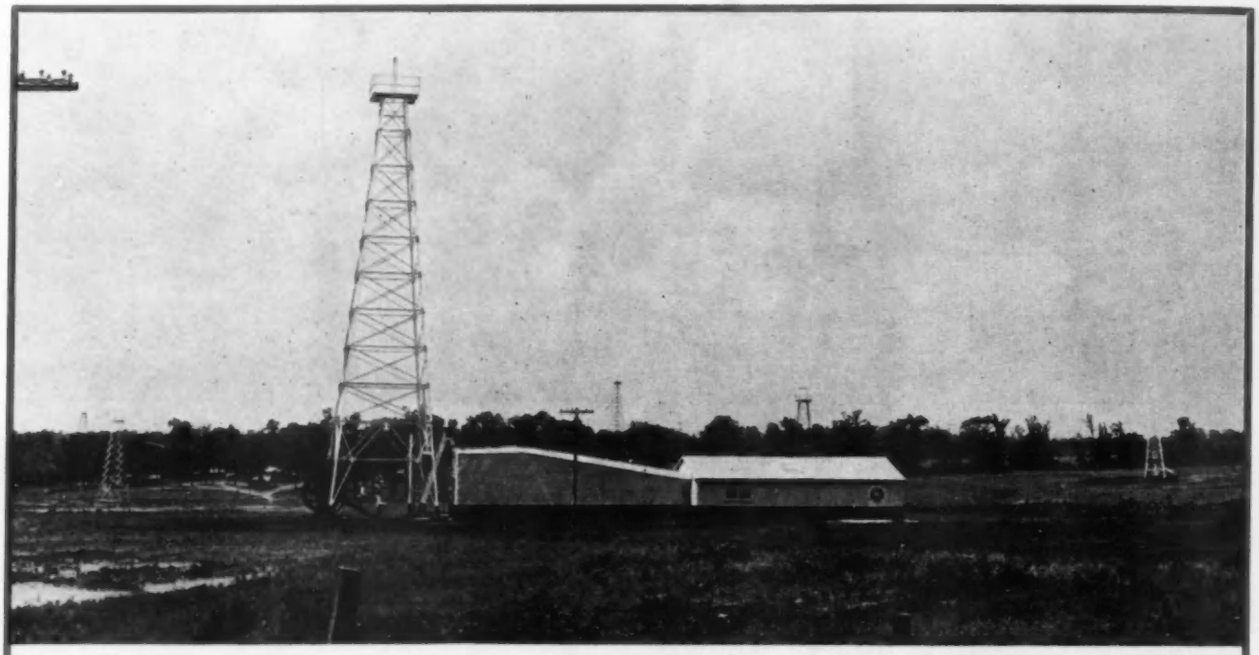
The average East Texas well will not be difficult to pump, and any well designed equipment may be used to advantage. Opinions among operators are so varied that it is difficult to reach conclusions. The fact that more than a dozen types are giving satisfaction is at least partial justification for the several opinions held in different parts of the field.

Many large operators have not decided on the type of equipment they will use, being content to watch the performance and results in low-pressure areas, with the hope that the more satisfactory types will show to advantage. It is generally conceded, however, that very light equipment now used to pump wells with a high fluid level may prove inadequate when it becomes necessary to fight for daily production. Many wells now barely past the flowing stage need little more than agitation with the pump, while a good percentage of the weaker wells show a high fluid level.

Bottom-Hole Pressures

The bottom-hole or formation pressure is an important variable factor, but it is not a true index of formation condition. With an average bottom-hole pressure almost as high as that of two years ago, it is not reasonable to conclude that the field occupies the same position it occupied two years ago. The withdrawal of 350,000,000 barrels of oil without serious loss of formation pressure has weakened the field's position more than pressure figures indicate.

A clean well that flows with a bottom-hole pressure of 1100 pounds may not flow at the same pres-



Many wells equipped with standard rigs like the above are still flowing

sure when water becomes a serious consideration. Many edge wells have stopped flowing because of water encroachment, although the bottom-hole pressure decline was negligible. Other wells have stopped flowing only because of a decline in formation pressure. Bottom hole pressure is a fairly accurate yardstick until water enters the picture.

The average fluid level for the field is high, standing about 100 feet for each 33 pounds of bottom-hole pressure. In the extremely low pressure areas that show bottom-hole pressures as low as 800 pounds, the fluid level stands at about 1200 feet from the surface in clean wells. Thus the lifting load is comparatively light even in the low pressure areas.

Along the east side of the field, where a thin and lenticular sand condition is found, low bottom-hole pressures predominate. Many wells along this strip are on the pump or gas lift. The great middle section is still flowing satisfactorily, and the north end presents a mixed flowing and pumping condition. The west side of the field shows the highest average bottom-hole pressure, but water has caused considerable trouble. Operators along the west side of the field are fortunate in having a higher formation pressure, since a slight water encroachment is not so serious in high-pressure wells.

The east and west sides, and north and south ends of the field are ideally suited to pumping operations as the pressure declines, or as water encroaches. Other means of lifting the oil may be applied successfully, but experience of the past two years has proved that the pump may be depended upon for the full daily allowable. The middle section of the field will be produced in the later stages with types of mechanical lifts. The pump, gas and air lift, and various types of flow valves have been successfully used in weaker wells along this important strip.

The lift will be heaviest along the west side, with water a distinct factor as the field declines. It will not be so much a question of dead weight as of a volume lift. A water cut of 50 or 75 percent will necessitate lifting from two to three times as much fluid as will be necessary in clean wells. The higher formation pressure along the west side will insure a satisfactory fluid level, despite the presence of water. Pumping equipment used along this side of the field will be much heavier than that used along the east side and the middle strip.

East Texas will be a great experimental ground for pumping equipment and methods, and it will not be difficult to obtain a trial for any type that holds promise. During the rush of installations two years ago, little attention was given to a standardized program, and a number of operators installed the most available and least expensive equipment. Since that time serious thought has been given equipment design, and it has been possible to compare results under varying conditions. Most of the large operators have installed a variety of pumping equipment to meet indicated conditions.

Most of the major companies hold open minds, but a few are beginning to show preference for certain types of equipment. Operators with most experience with mechanical lifts have done most toward standardizing on favorite types of pumping equipment. One of the largest producers in the field has only begun to give serious consideration to pumping methods. This company has only four of 575 wells on the pump, but now realizes that a number of weak wells will require pumping before the end of the year.

A large number of weak wells should be equipped for pumping, but operators have avoided the expense, where it was possible to obtain production by any legitimate means. In many instances it has been practical to flow strong wells on a lease to obtain the allowable for a limited number of weak wells where the latter are located to make the practice

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free from complications. Such a procedure has enabled many operators to postpone installation of pumping equipment that should have been placed in operation several months ago. A number of postponements have resulted in embarrassment to companies that have depended upon unusual arrangements for lease allowables.

Very little consideration is being given the question of future loads by many of the smaller operators, if the type of equipment installed is a reliable indication. Much of the equipment and many foundations are of a temporary nature. Many of the smaller producers are being influenced by price, especially where they are being financed. The tendency to get the oil at the lowest possible expense and with a low capital outlay is to be expected in a field so large as the East Texas district, but the more substantial operators are not allowing cost to stand in their way where heavy and expensive equipment is needed.

Unless a startling condition arises, most of the wells will be placed on the pump or equipped for pumping only after trouble has started. A number of operators are giving serious thought to pumping problems in sectors now showing low formation pressures, but the strong flowing areas are inclined to disregard the gradual approach of the pumping stage. Weak wells are to be found in the relatively high-pressure areas, a fact that gives some strength to the theory that pressure alone is misleading. It has been difficult to diagnose the trouble that has arisen in wells surrounded by strong flowing producers.

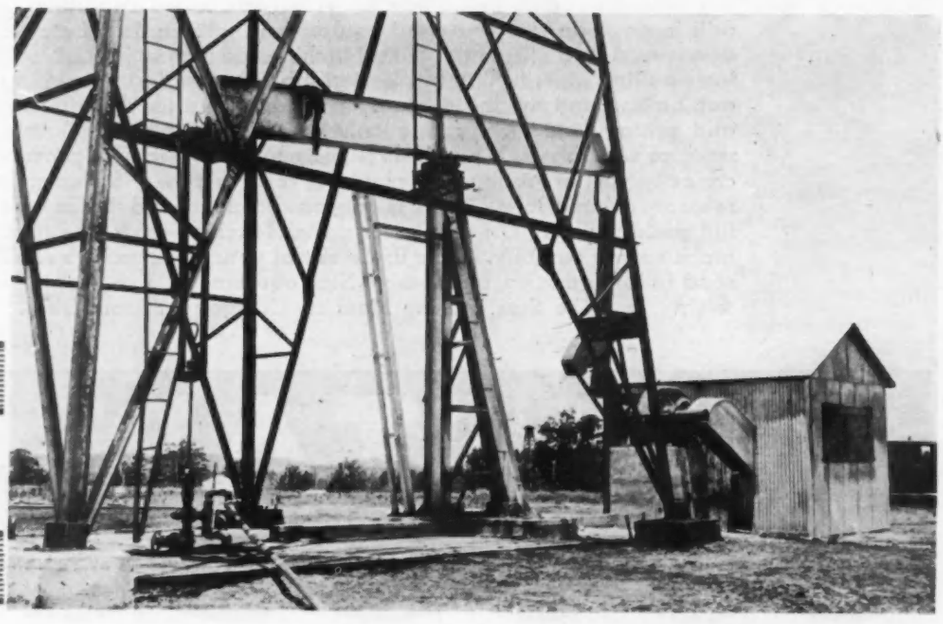
In some parts of the field, wells are being equipped with only enough energy to agitate the fluid column, which in turn causes the well to flow. Some of the larger and stronger independents are giving more serious thought to their pumping problems than many of the majors. This has been caused by some extent to the fact that several large independent producers obtain the bulk of production from edge leases, and have been using the pump for some time.

The installation of very light equipment has been deliberate in some sections of the field. Many of the wells are admittedly too lightly equipped to handle the standard loads that will accompany pumping in the future. Many of the small units that pump three wells each must be replaced or enlarged in the future. Already too many wells are being pulled from one set-up, and it is planned to pump only a portion of these wells at one time, keeping the power unit operating 24 hours per day. On a number of leases, where small units are admittedly only agitating the wells, the producers feel that this is justified by the small initial investment and interest saved on the larger outlay of money. Especially does this hold where the purchaser is being financed by the vendor. It is also felt that with wells in the fairway, the small units can be moved to advantage, thus making the delayed outlay of a larger sum pay for the original investment.

One thing that delays the installation of central powers is the uncertainty of the ultimate completed development of the leases. At least two major companies are using temporary units and installations until they can determine the best location for large central pumping powers. Where a producer has a properly balanced power set, and is forced to meet several offsets on one side of his lease, the power has lost its balance unless an intricate system of rod lines and swings is developed.

About 4000 wells have been equipped for pumping during the past 3½ years. It was difficult at times for manufacturers to meet the demands from this one field, although purchases ran in spurts. Of the 17,500 wells in the field, not more than 5000 could be placed on the pump on short order. Not all the remaining 12,500 wells will be pumped, but a large percentage of the flowing wells will ultimately fall into the pumping classification.

It is believed that an orderly campaign will be carried out, during which from 100 to 300 wells per month will be placed on the pump for a period of three or four years. In arriving at these totals, wells to be completed have not been considered. It will be difficult for manufacturers to meet demands if all



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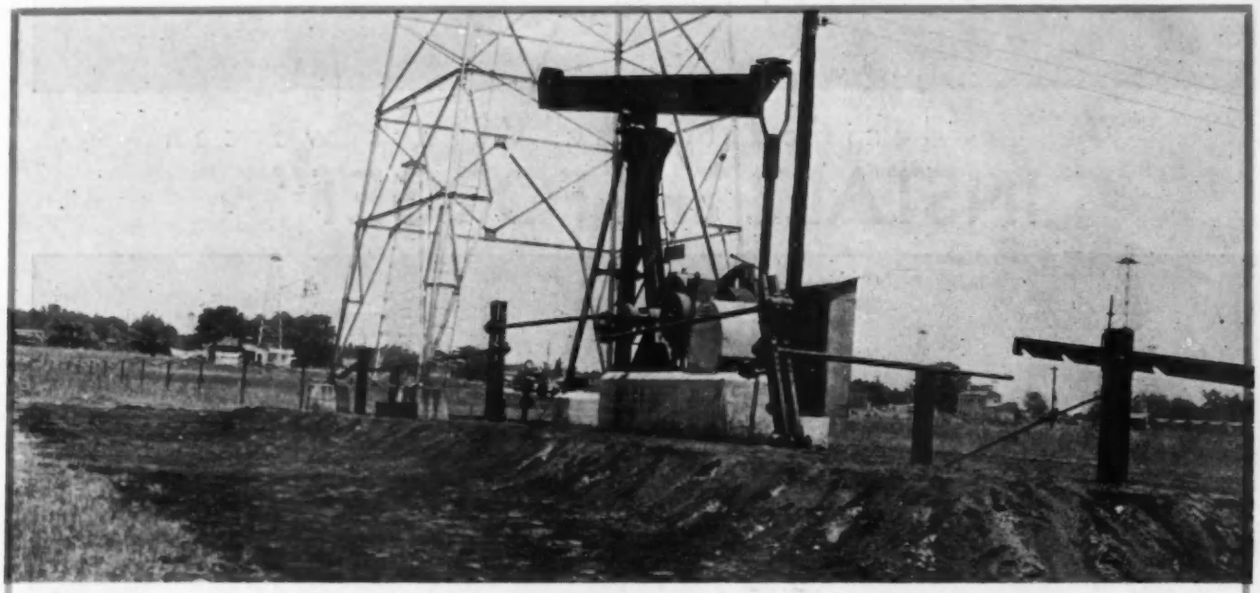


This well will be operated by a 15/40 horsepower motor. Two more wells will be pumped by the back crank takeoff.

operators wait until the last year of flowing life to install pumping equipment.

One of the most interesting developments in the East Texas field has been the trend toward a great variety of pumping installations. Few companies have taken an arbitrary stand, preferring to meet well and lease conditions with any type equipment that offers most promise. This flexible program has given any one of many large companies a variety of designs, and has postponed company concentration on any one type. Five of the largest operators have expressed a willingness to use any type of equipment that offers most advantages under given conditions. All of these companies, however, are anxious to find the most efficient tvpe for general purposes and are looking forward to a reduction in the number of varieties in use. The field is so large and conditions so varied that all types of pumping equipment soundly designed and built for pumping 3500-foot wells will be in demand as wells stop flowing. Already many companies are equipping leases in different parts of the field with three or four tvpes of equipment, and the larger companies are using temporary installations on as large a scale as the smaller operators.

Three major companies virtually strewed central powers up and down the field two years ago, but stopped the practice when more effective proration was established. Since that time hundreds of wells have been drilled on these and nearby leases, and a sharp rearrangement of balance will be required for operation. During the rush to place wells on a pumping status in 1933, two major companies almost exactly divided their attention between central powers and individual units. Most of these installations have been used so little that it has been impossible to determine the relative merits of the two types, but enough has been learned to prove that either will do the work well under average conditions.

One major company is anticipating heavier well loads and is providing a minimum of 10 horsepower average per well in installing prime movers. Some of the large independent operators are providing an even greater minimum horsepower, where water is expected. Location of the wells and their distance from the central power plant are conideration, and the possibilty of drilling additional wells also calls for thought. Most of the companies are installing prime movers with a good power margin, not being influenced too much by the present high fluid levels.

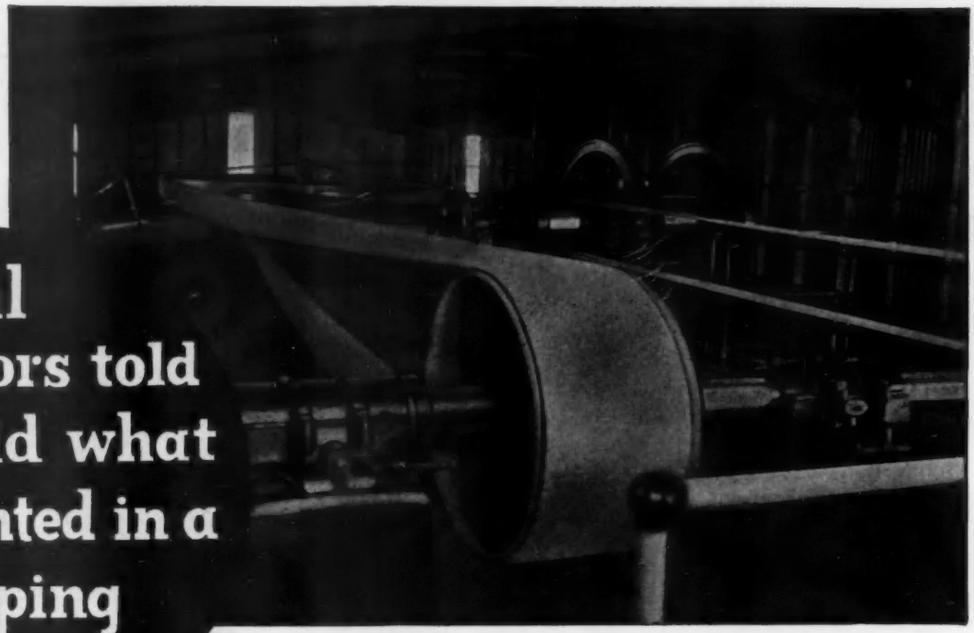
Company Practices

Stanolind Oil & Gas Company will use any type of pumping equipment that proves best adapted to individual lease and well conditions. These various installations will include electrically-driven units deriving power from the company's own generating plants, multi-cylinder units, geared power units, backside crank units handling three wells, and other types. The company is making a study of field conditions, and will install equipment on the strength of the determinations. It is believed that pumping will gain favor as the pressure declines.

Stanolind Oil & Gas Company installed a number of small generating plants to supply electrical energy for small groups of wells in different parts of the field. These generating units are very flexible and are practically independent of outside sources of supply. Each plant consists of a 165-horsepower, twin-cylinder, 16 x 20 gas engine; a 125-kva., 100-kw at 0.8 percent power factor, 440-volt, three-phase, 60-cycle generator; and an exciter and master control panel. The well equipment consists principally of a nine-, 15- and 25-horsepower motor; and a double reduction gear pumping unit equipped with flywheel, brake and crank counterbalance. The triple-rated motors were installed to insure handling loads from the lightest to maximum. An average of six wells will be pumped with one generating unit.

The company now has only a small percentage of its producing wells on the pump, and does not anticipate a rapid decline in the number of flowing wells. Enough has been learned, however, to indicate that the average well may be easily pumped.

Tide Water Oil Company was a pioneer in the in-



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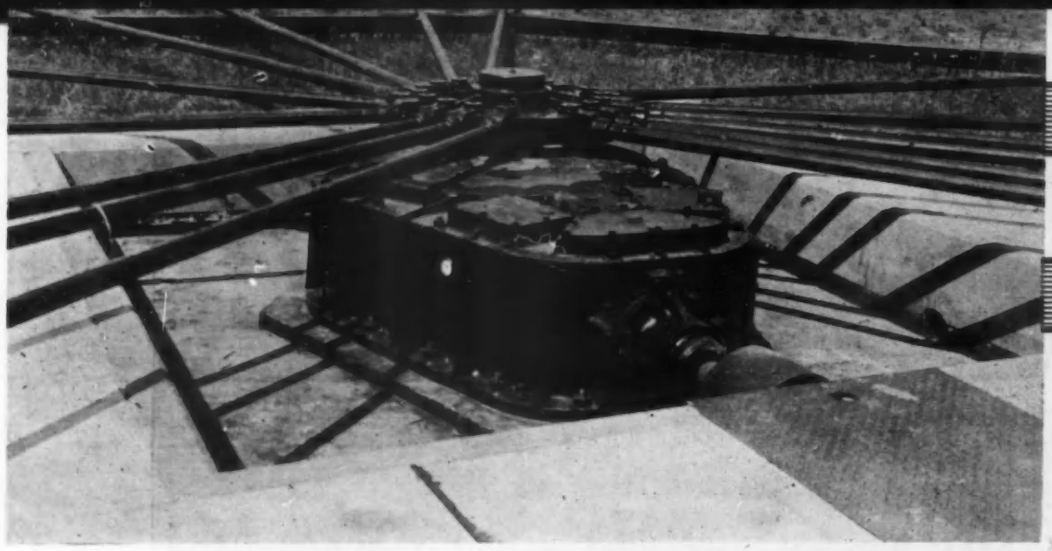

A geared power on one of Tide Water Oil Company's leases.

stallation of heavy geared central power plants, and was one of the first to get into action when the pressure dropped in 1933. Five large central power plants were installed on short notice, but most of these have never been used. The company has learned much from the operation of a large geared power on the M. H. Dean lease, an installation with an extreme capacity of 20 wells.

A typical geared power installation on a Tide Water Oil Company lease includes a 130-horsepower, two-cycle gas engine, from which power is transmitted to the geared unit via a heavy clutch, V-belt drive from one end of the line shaft to drive shaft, and the main four-inch drive shaft; the main geared power unit; and necessary auxiliary equipment. Operation of one of these large powers gives ample support to the belief that the maximum number of wells may be pumped where a satisfactory balance is maintained.

The company has made an extensive study of hook-on, hook-off and pick-up installations, and has helped to design a number of safe types for use with the central power installations. The heavy geared power units deliver from 36- to 42-inch strokes. It was found during the course of experiments that the average East Texas well requires only from four to six horsepower for normal pumping operations, but location of the well, fluid level, nature of the fluid, and other considerations affect the power required.

Tide Water Oil Company also has a number of individual pumping units, and will use any equipment that proves adapted to individual lease and well conditions. The average installation cost of a 16-well geared power unit was about $11,000, but they were installed in 1933 when costs were considerably lower than those of today. It is not so much the original cost as the adaptability that determines the selection of equipment by this company.

Sinclair Prairie Oil Company has shown a preference for central powers, but still maintains an open mind on pumping equipment. This company has about 800 producing wells in the field, of which 100 are equipped for pumping on power and about 30 are otherwise equipped for pumping. Not all wells thus equipped are on the pump, and a considerable pressure drop must take place before all available equipment will be pressed into service.

Sinclair Prairie Oil Company has designed a number of interesting rod swings for use with large geared pumping powers. Turns of 90 degrees in the well rod lines are not unusual, and through judicious use of these swings it has been possible to pump wells located on the opposite side of the power house from the geared unit. They have also permitted maintenance of balance on irregular leases. The swings are made of heavy pipe, equipped with high pressure lubrication, are supported on and by heavy concrete foundations, and are made with a high safety factor. The swings were designed and made in the company's shops.

Marathon Oil Company, one of the largest operators in the south end, is studying field conditions in an effort to determine the most efficient methods of pumping weak wells. Of the company's 500 producing wells, less than 40 are equipped for pumping on central powers, and 10 have other types of pumping equipment installed. A preference has been shown for central powers where large leases are involved and wells are favorably located, but individual units will be installed where wells require special attention, and on the smaller leases.

Shell Petroleum Corporation has a remarkably high percentage of flowing wells, and only recently started giving serious consideration to pumping problems. Only four of the company's 575 producing wells are on the pump, but a gradual increase in the number of pumping wells should be expected. The company will make a study of field and well conditions, and will install equipment best suited to the different leases. This operator was one of the few that did not become seriously alarmed at the rapid pressure drop of 1933, a period that caused a number of large companies to equip about 2000 wells for pumping.

Magnolia Petroleum Company has shown such a preference for standard rig pumping units that it has become the leader in the installation of this type equipment. The company has about 250 wells equipped for pumping in this manner, and does not have more than three or four wells with other equipment installed.

Gulf Production Company installed a large number of central powers, but has not placed all the total in use. The company has more than 15 central powers and about 140 wells equipped to pump with rod lines. In addition it has about a dozen wells equipped with standard rig units, and a few with back-side cranks. This company, like most of the majors, has not decided on its plan of attack in some parts of the field.

Humble Oil & Refining Company has not devoted as much attention to pumping methods as to gas-lift installations, but recognizes the necessity of pumping

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wells of a certain type. Of the company's 180 wells equipped for pumping, 35 are back-side crank installations, 35 are connected to central powers, 105 are individual pumping units, and the remainder are standard rig units.

The Texas Company has divided its pumping installations among a number of types that look most promising in different parts of the field. Wells equipped with pumping equipment include about 30 with back-side cranks, 60 on central powers and rod lines, 12 on individual units, and five with standard rig units. This company has some of the largest central powers in the field, one being equipped with a 160-horsepower gas engine. This company will provide a minimum of 10 horsepower average per well in installing prime movers.

Sun Oil Company has about equally divided its attention between back-side crank units, central power installations, and individual pumping units. Of the company's 135 wells equipped for pumping, 29 are operated with back-side crank installations, 76 are on central powers, and 30 have individual pumping units.

Amerada Petroleum Corporation has shown a distinct preference for standard rig pumping units, but has found a strong second choice in back-side crank installations. The company's wells equipped for pumping include 23 of the former, 18 of the latter, and 10 wells on a central power.

Arkansas Fuel Oil Company has installed several large bandwheel central powers, as well as individual well equipment. The central powers have not been used for steady pumping operations.

Independent operators have as many wells equipped for pumping as the 14 major companies. This number is growing rapidly, due to the large number of edge leases owned by the smaller producing companies. Independent companies have equipped almost 800 wells with standard rig units, having more than twice as many such installations as the majors. The smaller operators have installed back-side crank units for pumping about 300 wells, and have equipment installed at 450 wells for operation from central powers. The independents have equipped more than 400 wells with individual pumping units, but many of these installations are idle. Many weak wells are being equipped for pumping with the equipment that seems best suited to lease conditions.

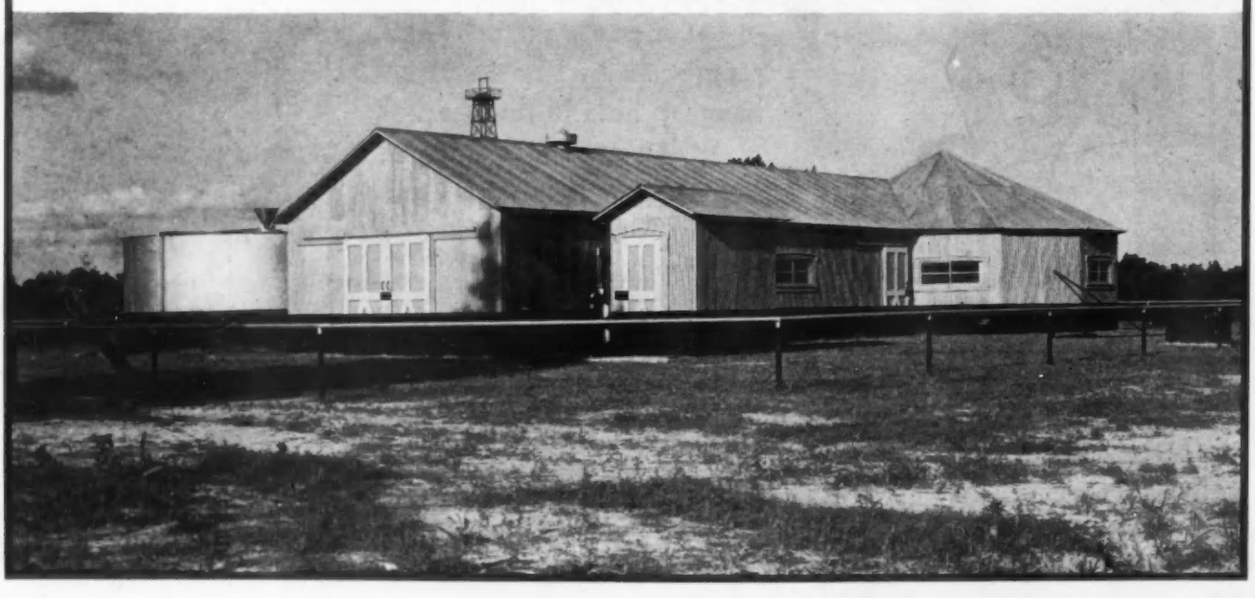
Many small operators, however, are being influenced by cost, and some of the most recent installations were installed to meet present conditions. A number of small units that are now pumping three wells will not handle a 50 percent heavier load than the present one. This indicates the necessity for heavier equipment in the future, where operators have not provided for an increased load. Many of these light installations were assembled on the theory that it will be cheaper to use the less expensive equipment for two or three years and replace it with heavier units, than to install the more expensive permanent equipment in the beginning.

Many of the temporary installations are not properly braced, have light foundations, and are generally too flimsy to handle the loads that are expected in the next four years. A number of the three-well units are pumping wells with high fluid levels, and are balanced to operate under present conditions. Encroachment of water or rapid decline in the fluid level of one or two of the three wells will cause trouble. The small prime movers used will not handle either heavy or poorly balanced loads. It will be a simple matter, however, to install heavier engines and to construct more permanent foundations.

All types of prime movers are being used by various operators. Magnolia Petroleum Company leads in the number of gas engines, because of its large number of standard rigs equipped for pumping. The company has more than 250 wells equipped with this type of prime mover, Humble Oil & Refining Company and Stanolind Oil & Gas Company each have about 50, and the independent companies have about 550 gas engines in use or ready for use. The total number of gas engines in use or ready for use is around 1000.

About 300 wells have been equipped with electric motors. Humble Oil & Refining Company with 50, and Stanolind Oil & Gas Company with 35, lead in

Arkansas Fuel Oil Company's Wheelis central power plant.



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(*Left*) This 9-7/8-in. diameter, four-way bit, hard-set with Haystellite Inserts and hard-faced with Haystellite Composite Rod drilled through 535 ft. of lime, chalk and sandy shale in Caddo field, Caddo Parish, La. The well was completed December 24, 1934.

(*Right*) This 12-1/8 in. diameter, four-way bit, also hard-set with Haystellite Inserts and hard-faced with Haystellite Composite Rod drilled 612 ft. in the Sligo Gas Field, Bozier Parish, La. The well was completed November 23, 1934.

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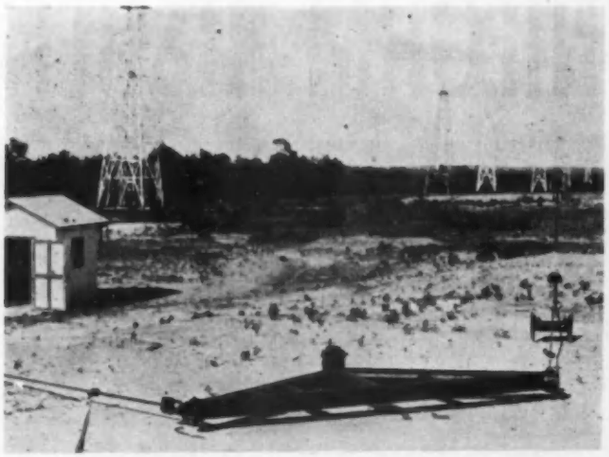


A 90-degree swing that is pressure lubricated.

this type of prime mover. The independents have about 175 wells equipped for pumping with electric motors, most of which are in daily use.

Gasoline or multi-cylinder motors are gaining favor in many parts of the field, particularly for back-side crank pumping operations. Independent operators are using about 75 of these motors, and a number of major companies are experimenting with them. Sun Oil Company is using or has ready for use more than 20 small motors. Most of the motors as installed require a minimum of attention, and have been converted to use natural gas. In a number of instances it is difficult to classify the engine, since it will use either natural gas or gasoline. Most of the motors of this type drive through reduction gears and V-belts.

Miscellaneous surface equipment does not differ radically from that used for pumping 3600-foot wells in other fields. Major companies are using heavy rod lines from central powers to wells, and are designing swings to meet lease conditions. Independents are giving increased attention to safety, and have mostly installed the latest types on hook-on, hook-off and pick-up equipment.

Paraffin has caused considerable trouble in many low-pressure wells. It accumulates near the top of the hole, and particularly along the level of an upper cold shale and water streak. This paraffin trouble is closely associated with the tendency of weak wells to stop flowing. A number of pumping wells show such an accumulation of paraffin at and near the top of the hole that power equipment is forced to deliver from 10 to 40 percent more energy than would normally be required. Accumulation of paraffin has forced the installation of pumping equipment for agitating purposes, most of the very light equipment being in this classification.

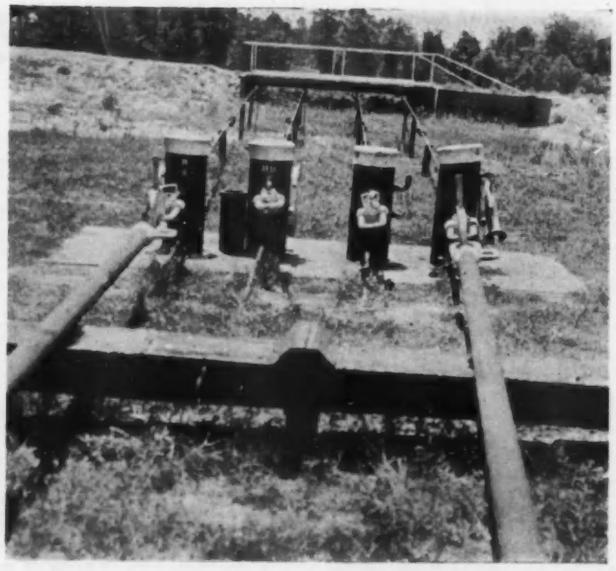
All types of pumps are being used with the conventional rods and tubing. Sand causes little trouble in the average well, and pumps give good service. Most of the wells are equipped with two-inch tubing, and experience has shown this size to be adequate under all average conditions. The sucker rod sizes range from three-fourths to seven-eighths of an inch, but the former size is heavy enough. A number of operators favor very light rod strings where the fluid level is high.

The field is being extended toward the east, and a large percentage of the productive acreage added during the past year lies along this strip. Most of these edge wells are being placed on the pump as they are completed. The producing zone is thin and laminated with shales, but little water has been developed on this side of the field. The fluid level is lower than along the west side and down the middle strip, but absence of water gives good pumping conditions. The north end of the field has not been well defined, and a large percentage of wells in this sector will be placed on the pump as they are completed.

A check of wells nearing the border line between the flowing and pumping stage shows that a bottom-hole pressure of from 900 to 1150 pounds is required to flow wells satisfactorily, but formation pressure is not the only factor involved. Several wells have stopped flowing with bottom-hole pressures of 1100 pounds, and a few have refused to "kick off" with a pressure of 1200 pounds. The average bottom-hole pressure is about 1215 pounds, but strips of lower and higher pressures exist. Many wells are flowing with low bottom-hole pressures, but they are usually surrounded by immediate areas that show higher pressures.

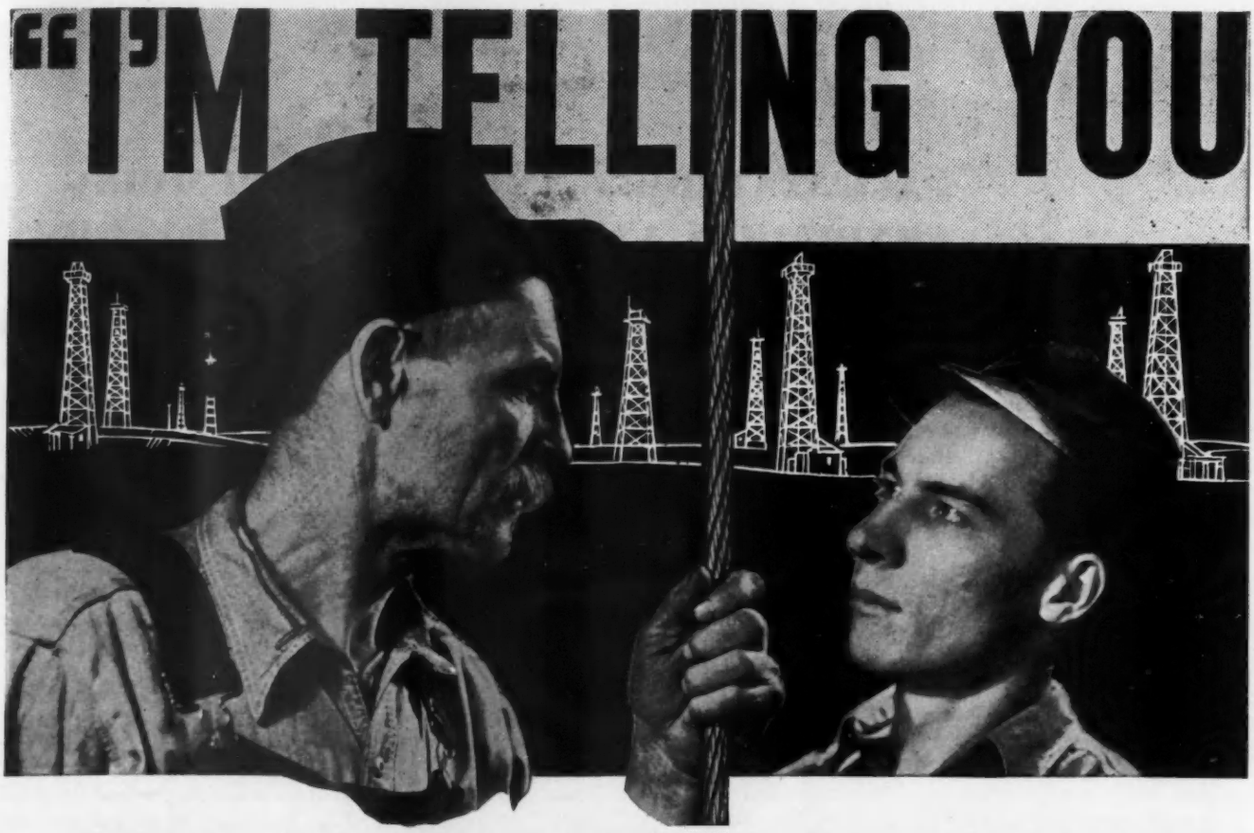
The intense development of the field is placing it in a vulnerable position, and each new well weakens the position of the older producers. A higher percentage of completions is going on the pump than was shown during the early and intermediate development periods.

The field is not in a dangerous position at this time, and it is believed that the gradual manner in which the bulk of the wells will go on the pump will work to the advantage of all concerned, better than a program that would place most of the wells on the pump in very short order.



Rod lines from four wells come in the central power plant in parallel rows.

"I'M TELLING YOU



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Sucker Rod Selection

FACILITATED BY ANALYSIS OF PUMPING CONDITIONS AND PERFORMANCE RECORDS

By FLOYD SWINDELL, Staff Writer

CHOOSING sucker rod materials was not a particularly distressing problem in the early days of the industry when wood and iron were the only materials generally available. In those days pumping conditions and consequently sucker rod materials were comparatively simple. Today's picture, unfortunately, isn't quite as clear, and the producer who wishes to be thorough in selecting sucker rods must consider nearly 40 different rods in making his decision.

During the years from Titusville to Oklahoma City, pumping conditions have become increasingly complex and with these changes has come the constant problem of what type of equipment should be used. One of the most troublesome of these problems has been that of sucker rods.

Ample evidence is available to show the importance of proper sucker rod selection in keeping lifting costs to a minimum. No one sucker rod material, as yet developed, is capable of pumping all wells economically and the rod which will pump a "Heavy Non-Corrosive" well best is many times a costly failure in a "Light Corrosive" well.

The price of misapplication and improper selection becomes apparent when it is considered that a 3000-foot string of A.P.I. sucker rod costs between $400.00 and $1,000.00, depending on type and destination. Initial costs tell only part of the story, though, and serious thought must be given the problem of dollars and cents expended in keeping this equipment in service. A recent survey of representative companies evaluating pumping costs shows charges ranging from $10.00 to $25.00 per rod job, which figures do not include production losses and other indirect costs. Using these figures, a few simple deductions quickly show that even a few rod breaks per month are a costly maintenance charge and one of these companies finds it good practice to retire a string of rods as soon as four breaks in one month are experienced.

Method of Procedure

Considerable work has been done on the problem of proper sucker rod selection by a number of producing companies and it is interesting to note that the general method of procedure followed has been about the same in principle. It is founded in research and proved in field practice.

This method is, of course, not new. In fact, a statement of it may seem quite obvious, but often it is well to put in a few words a principle such as this, as it enables everyone to progress on a common ground, accumulate related data and coordinate their efforts toward a general progress.

The method, which is sucker rod selection based on an analysis of pumping conditions, resolves itself into two major phases. First, an analysis of the pumping conditions of a well that is about to go on the pump and, second, an analysis of sucker rods, their properties and records in wells where similar conditions have prevailed. Superintendents and engineers have preferred this procedure because it eliminates guesswork and makes it possible to select the best type of sucker rod after the facts of the conditions to be met are studied rather than before.

Pumping conditions are usually analyzed by, first, a study of the fluids produced and, second, a calculation or more preferably an exact determination of the impact loads to be handled. Experience indicates that for the practical purposes of sucker rod selection a general differentiation between corrosive and non-corrosive fluids is satisfactory. Corrosive fluids may be considered as those causing pitting and/or embrittlement due to salt water and hydrogen sulphide. A simple method of fluid classification consists of an examination of sub-surface equipment (example-tubing) to determine pitting and the use of lead acetate paper to indicate the presence of hydrogen sulphide. If no pitting is observed and no discoloration of the lead acetate paper effected the problem can be generally considered as a non-corrosive pumping condition.

Pumping loads are somewhat of a more complicated problem and are not quite so easily disposed of. In general they can be controlled by the operator, being mainly dependent upon the depth of the pumping fluid level, size of the pump, the length and speed of the stroke and the gravity of the fluid produced.

Other Factors

There are, of course, some other complicating conditions and nearly every producer familiar with pumping problems has experienced the phenomena of having two wells practically identical in mechanical factors, give entirely different sucker rod results. One good reason for such a condition is friction loads due to crooked holes.

Impact loads on sucker rods can be fairly accurately calculated, but because of the lack of information in many cases as to fluid levels and the complicating effects of crooked holes, plunger fits, etc., actual measurements are preferable.

Endurance fatigue limits have been determined for practically all the steels used in sucker rods. These figures can generally be considered the maximum load in pounds per square inch to which a sucker rod can be repeatedly stressed without failure. These figures can be more safely used in non-corrosive conditions than where corrosion is a problem, as pitting and embrittlement are not constant factors and rapidly reduce the endurance of all metals. Endurance fatigue limits for non-corrosive conditions are generally found to be approximately 45 percent of the ultimate strength of a

THE USE OF EXPLOSIVES IN PROSPECTING FOR OIL

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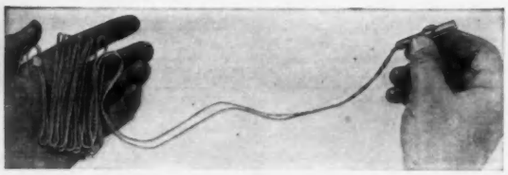

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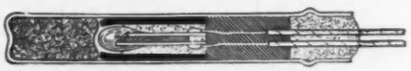

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ATLAS

EXPLOSIVES

ATLAS EXPLOSIVES

metal and this forms a quick method for selection purposes.

Performance Records

Field performance is the best yardstick for the value of any piece of equipment. Laboratory tests and studies are extremely valuable in cutting the need of field records to a minimum, but it is the consensus of opinion of research and field men talked to that a coordinated program of research and field records bring the best results in selecting sucker rod materials.

Sucker rod records when tabulated on a uniform basis tend to group themselves into certain classifications. One type of rod will stand out as a better performer in moderately heavy non-corrosive load wells but will rapidly fail in heavy conditions. Another rod will do excellently in heavy non-corrosive conditions but will break rapidly under lighter loads if hydrogen sulphide is present. Salt water pitting will quickly destroy some rods that give outstanding performance in sulphide conditions.

A study of service records will not only insure better selection but will show types of steels that have better general application than others, thus insuring a simplification of warehouse stocks and field standards.

Producers report that much guessing and even experimenting may be cut short in selecting sucker rods, if when a new well goes on the pump an analysis of the conditions be carefully checked against the record of rods in similar type wells.

One of the major companies that has given considerable thought to pumping equipment, and which has

FIGURE 1

Analysis for Sucker Rod Replacement

Lease_____ Well_____ District No._____ Date_____

Recommendation_____

_____

_____

PRESENT PUMPING CONDITIONS

Present Potential:— Oil_____ Water_____ Total Fluid_____

Present Production:—Oil_____ Water_____ Total Fluid_____

Total Depth_____ Pumping Depth_____ Fluid Level_____ V.C._____

Tubing Size_____ PUMP:—Size_____ Make_____ Type_____

Pumping Hours_____ CYCLE:—Length Stroke_____ S.P.M._____

Polished Rod Load:— Dynamometer_____ Calculated_____ Class_____

Corrosive Conditions_____ Is H_2S Present_____

Has Rod-Cut Tubing Been Reported_____ Estimated Remaining Life of Well_____

PRESENT SUCKER ROD STRING

	⅞"	¾"
Make		
Date Installed		
Feet Installed		
Unit Stress		
Actual Days Service		
Date		
Sectional Replacements:— Make		
Feet		
Number Individual Replacements		
Disposition of Rods		
Value of Rods		
Trial Equipment Number of Present String		
Number Hours Labor Due to Failures		

REMARKS:—_____

_____

_____

_____

b-500
November 27, 1934.

_____
District Superintendent

The

Fastest, Streamlined . . . Most Powerful

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Travelling blocks in which gigantic size and strength have been shaped, balanced, and adapted by precise engineering for the utmost efficiency, are typical of modern drilling equipment. What might be conceived of as just a set of big pulleys in a case, has been brought to the nicety of a jewelled watch. For the efficiency and reliability of such travelling blocks, in the hardest service, American Roller Bearings are an essential part.

AMERICAN ROLLER BEARING CO., PITTSBURGH, PA.

AMERICAN ROLLER BEARINGS

FIGURE 2
Record of Failures

DEPTH	A Date	B Date	C Date	D Date	E Date	TYPE		
						Body	Pin	Box
' to 100'								
100' to 200'								
200' to 300'								
300' to 400'								
400' to 500'								
500' to 600'								
600' to 700'								
700' to 800'								
800' to 900'								
900' to 1,000'								
1,000' to 1,100'								
1,100' to 1,200'								
1,200' to 1,300'								
1,300' to 1,400'								
1,400' to 1,500'								
1,500' to 1,600'								
1,600' to 1,700'								
1,700' to 1,800'								
1,800' to 1,900'								
1,900' to 2,000'								
2,000' to 2,100'								
2,100' to 2,200'								
2,200' to 2,300'								
2,300' to 2,400'								
2,400' to 2,500'								
2,500' to 2,600'								
2,600' to 2,700'								
2,700' to 2,800'								
2,800' to 2,900'								
2,900' to 3,000'								
3,000' to 3,100'								
3,100' to 3,200'								
3,200' to 3,300'								
3,300' to 3,400'								
3,400' to 3,500'								
3,500' to 3,600'								
3,600' to 3,700'								
3,700' to 3,800'								
3,800' to 3,900'								
3,900' to 4,000'								
4,000' to 4,100'								
4,100' to 4,200'								
4,200' to 4,300'								
4,300' to 4,400'								
4,300' to 4,400'								
4,400' to 4,500'								
TOTALS...								

	Past 30 Days	Preceding 30 Days	2nd Preceding 30 Days	3rd Preceding 30 Days	4th Preceding 30 Days	5th Preceding 30 Days	6th Preceding 30 Days
Failures by Months ⅞".							
Failures by Months ¾".							

found that such a study is a good investment in economy, first classifies all wells as to load. Class A wells are those weighing 16,000 pounds or more; Class B are those weighing from 12,000 pounds to 16,000 pounds; and Class C are those weighing from 8,000 pounds to 12,000 pounds; and Class D are those weighing less than 8,000 pounds. All wells are then tested and classified as corrosive or non-corrosive, depending on fluid conditions. All Class A wells and all Class B full-time pumping wells are equipped with new rods; Class B part-time pumping wells and all Class C wells are equipped with used rods which will give service on light wells but which would not be depended upon for service in one of the other classes. This equipment borders on the junk stage.

This company also keeps a record on all Class A and B wells. Breaks are tabulated and reported once a month to general headquarters. Figures 1 and 2 are the form used in recording this information, and are placed on opposite sides of the sheet.

Material selection is based on the various well records and on controlled field tests. Rod assignment for new strings and replacement are then based on the analysis of pumping conditions of individual wells and the material performance records.

Results

Results of this practice have been outstanding and individual well records have shown savings in material and labor costs as high as $2,000.00 in 12 months' time. Second-hand equipment stocks also have been kept to a minimum and a material improvement in production losses effected.

Pumping conditions are certainly not becoming more simple. On the contrary, they are becoming more complicated. Manufacturers today are offering more types of rods than ever before in the history of the industry. Consequently, the trend is sure to be toward more organization of records of sucker rod performance, a more accurate analysis of conditions and a more simplified tabulation of both. Also, there should be a greater effort on the part of producers and sucker rod manufacturers to keep new developments clear and understandable.

The Oil Well Tubing of High-Standard Service

The same high standards of quality and dependability that distinguish Pittsburgh Seamless Drill Pipe and Casing are rigidly maintained in Pittsburgh Seamless Oil Well Tubing. It is furnished in the standard A.P.I. sizes and specifications, with adequate external upset to maintain full strength under the threads. Depend on "Pittsburgh" for dependability.

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Pittsburgh, Pennsylvania
New York Detroit Chicago St. Louis Houston
Los Angeles San Francisco

Electric

By W. C. LANE, Electrical Engineer

A low power factor acts something like a leaky water line in limiting the capacity of a pump; it reduces the load an electric plant will carry. The remedy discussed in this article increases the capacity of a system materially at a comparatively small expenditure. It is in use on many industrial installations, but has not been used widely in the oil field. Connecting three wires from a piece of apparatus to a motor, or three wires from an assembly to a line serving a group of wells is all that one needs to do in applying the method.

TWO distinct major items are included in the cost of generating electrical energy used for operating induction motors. One is for the power-producing current, which is converted into useful work, and the other is for the magnetizing current, which may be regarded as a necessary evil. The former causes kilowatt-hours to be registered on the meter, while the latter affects the meter reading only indirectly and to a limited extent. Payment must be made for this magnetizing current, however, for more than the actual energy loss it incurs, for it increases materially the investment in the generating plant and in the transmission system.

The effect of the magnetizing current on the capacity of a plant was discussed briefly in a recent article ("The Cause of Low Power Factor and Effect on the Capacity of a Generator," THE OIL WEEKLY, June 10, 1935). In this article it was stated that the proportion of the power producing current to the electrical total of the magnetizing and power-producing currents is called the power factor and that a low power factor is disadvantageous from several points of view. Also, that this quantity depends entirely on the design of an electrical device and its exact value can be controlled only to a limited extent after an installation has been made.

For obtaining a maximum power factor, and thus make available a maximum generator capacity, it is necessary to keep all motors loaded to their rated capacity and to avoid the conventional oil field practice of maintaining a voltage at the motor terminals greatly in excess of that for which they are designed. In case all the motors on a small plant, or on a particular feeder, are lightly loaded the power factor may be improved by lowering the voltage below normal. This practice is not as objectionable as it may seem on the surface, for transmission systems are designed for full load conditions and when the load is light the line losses will not be out of proportion when the power is transmitted at a subnormal voltage.

From what has just been said, it seems obvious that it is impossible to improve the power factor of a standard motor after it has once been installed on a load and is operated under normal conditions. However, it is possible to apply remedial devices and neutralize the effect of the magnetizing current on the system. Of the two methods in common use, the simplest is that of connecting a static condenser or capacitor as it is called, to the terminals of the motor. Doubtless the wide use of the radio has made the condenser a familiar device to all. It is one of the simplest electrical contrivances in use, consisting of two groups of metallic plates or sheets, separated by an insulating material such as air, mica, oiled paper or paraffin. The capacity of a condenser depends on the area of one of the sets of plates, the material between the two sets, and the thickness of this material. Possibly one third of one percent is a conservative estimate of the energy dissipated in well constructed condensers, so their efficiency is practically 100 percent. The energy stored in a charged condenser is proportional to the square of the voltage applied to its terminals, so that the effectiveness or corrective effect of a condenser on a circuit will be increased

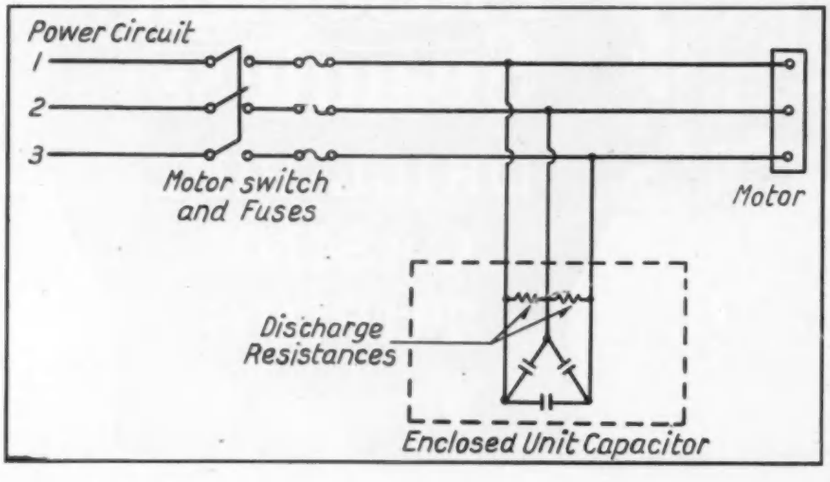
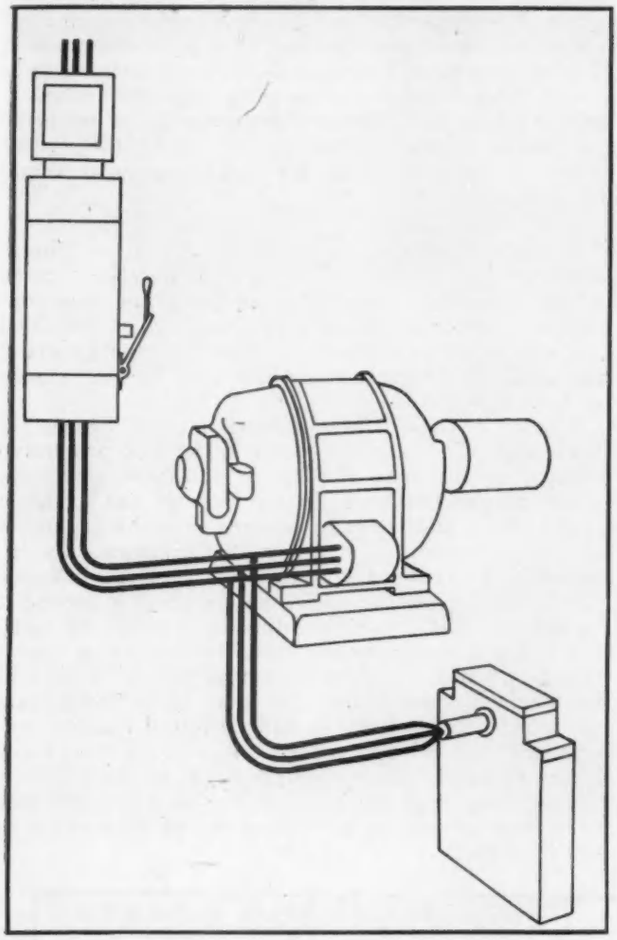


FIGURE 1

Wiring diagram of enclosed unit capacitor, installed at motor terminals.

System Capacities

MAY BE ENLARGED AT LOW COST BY INSTALLATION OF STATIC CONDENSERS



materially by increasing the voltage over it, so long as the insulation separating the plates does not fail. This feature accounts for the fact that a 2300- or a 4000-volt condenser costs less than one of an equivalent capacity rated at 460 volts.

Figure 1 shows a common method of connecting a motor and a condenser to a three-phase motor circuit. When the capacity of the condenser has a specific value, for a given load on the motor all the magnetizing current will be supplied by the condenser, and only the power producing current will flow in the power line and in the generator that supplies energy to it. The magnetizing current, which stores energy in the iron of the motor during one half of a cycle, is returned to the circuit by the iron during the other half of the cycle. The condenser behaves in exactly the same way with respect to the circuit, but the action takes place at a different time in the cycle. That is, during the time the iron is being stored with energy, the condenser is discharging energy into the circuit, and when the iron is returning energy to the circuit the condenser is absorbing it. Hence, the condenser neutralizes the magnetizing current in the power circuit.

Figure 2 shows how simple it is to apply a static condenser to a standard motor installation. In doing so, the generator and all apparatus in the system between the generator and the junction of the condenser and motor circuits are relieved of the burden of carrying the magnetizing current. It should not be forgotten that a charged condenser is dangerous, and that opening the switch leading to it does not render it harmless. Where a condenser is connected directly to the motor terminals, as in Figure 1, it will discharge itself automatically through the motor winding when the switch is opened. Some manufacturers eliminate any possible hazard by equipping their condensers with high-resistance discharge units as shown in Figure 1.

FIGURE 2

Schematic diagram of connections when box-type capacitor is installed at motor terminals.

In applying static condensers to a system for power factor correction several methods may be used. A unit of suitable capacity may be associated with each motor or an assembly of capacitors may be applied at some central point to the power line serving a group of motors, or it may be placed inside the power house. When power is purchased and the only object of raising the power factor is to reduce the power bill, as in a case where a power-factor clause is in force, the group may be connected to the incoming line at any point on the load side of the totalizing watthour meter. Obviously, individual motor treatment is the best system as it confines the magnetizing current to the motor-condenser circuits but the first cost of applying it will probably be somewhat higher than the other methods.

There are several ways of connecting a condenser to an individual motor, the simplest and most flexible of which appears to be that shown in Figure 2. Since the energy stored in a condenser is proportional to the square of the voltage, while the difficulty of insulating one does not increase according to the same

Power-Factor Improvement Table

ORIGINAL POWER-FACTOR IN PERCENT	DESIRED POWER-FACTOR IN PERCENT										
	80	81	82	83	84	85	86	87	88	89	90
50	.982	1.008	1.034	1.060	1.086	1.112	1.139	1.165	1.192	1.220	1.248
51	.936	.962	.988	1.014	1.040	1.066	1.093	1.119	1.146	1.174	1.202
52	.894	.920	.946	.972	.998	1.024	1.051	1.077	1.104	1.132	1.160
53	.850	.876	.902	.928	.954	.980	1.007	1.033	1.060	1.088	1.116
54	.809	.835	.861	.887	.913	.939	.966	.992	1.019	1.047	1.075
55	.769	.795	.821	.847	.873	.899	.926	.952	.979	1.007	1.035
56	.730	.756	.782	.808	.834	.860	.887	.913	.940	.968	.996
57	.692	.718	.744	.770	.796	.822	.849	.875	.902	.930	.958
58	.655	.681	.707	.733	.759	.785	.812	.838	.865	.893	.921
59	.618	.644	.670	.696	.722	.748	.775	.801	.828	.856	.884
60	.584	.610	.636	.662	.688	.714	.741	.767	.794	.822	.850
61	.549	.575	.601	.627	.653	.679	.706	.732	.759	.787	.815
62	.515	.541	.567	.593	.619	.645	.672	.698	.725	.753	.781
63	.483	.509	.535	.561	.587	.613	.640	.666	.693	.721	.749
64	.450	.476	.502	.528	.554	.580	.607	.633	.660	.688	.716
65	.419	.445	.471	.497	.523	.549	.576	.602	.629	.657	.685
66	.388	.414	.440	.466	.492	.518	.545	.571	.598	.626	.654
67	.358	.384	.410	.436	.462	.488	.515	.541	.568	.596	.624
68	.329	.355	.381	.407	.433	.459	.486	.512	.539	.567	.595
69	.299	.325	.351	.377	.403	.429	.456	.482	.509	.537	.565
70	.270	.296	.322	.348	.374	.400	.427	.453	.480	.508	.536
71	.242	.268	.294	.320	.346	.372	.399	.425	.452	.480	.508
72	.213	.239	.265	.291	.317	.343	.370	.396	.423	.451	.479
73	.186	.212	.238	.264	.290	.316	.343	.369	.396	.424	.452
74	.159	.185	.211	.237	.263	.289	.316	.342	.369	.397	.425
75	.132	.158	.184	.210	.236	.262	.289	.315	.342	.370	.398

law, condensers are sometimes connected to low voltage motors through a step down transformer. The choice between these two methods is entirely a matter of economics.

Motors are available which have two distinct windings, one of which is connected to the power line and the other to a condenser. The latter circuit is wound for a higher voltage than the former and is connected directly to the condenser, thus eliminating the transformer. Several types of so-called unity power factor motors have been offered to the trade from time to time, but oil country engineers seem to prefer straight squirrel-cage and wound-rotor motors by reason of their simplicity and lower first cost.

The curves given in Figure 3 show the effect on the current consumption of a 440-volt, 15/35-horsepower, 1150/570-revolution per minute motor used to pump a well when operated on the low-speed side with and without the corrective effect of a static condenser. These curves represent extremely bad operating conditions, for the well was very badly out of balance and the controller was set on the fifth control point of a nine-point controller. However, such cases are not as uncommon as they should be for, unfortunately, on some properties the worth of a pumper is still measured by the total number of barrels of oil he is able to put into the tank and the efficiency of his methods are not always analyzed as carefully as they should be.

As an abstract example of what may be accomplished, let it be assumed that the power factor on a small isolated plant equipped with a 156-KVa generator and an engine capable of carrying a 156-KW load is found to be 60 percent and that the motor load is such that the generator carries its rated amperage. Assume that additional wells have been completed so that more generator capacity is needed. The table printed below enables one to determine in a very simple way the capacity required. The capacity necessary to bring the power factor up to 90 percent is found by multiplying 156 by 60 percent and by a factor in the table found opposite to 60 and 90 percent.

Thus, $156 \times .60 \times .85 = 79.56$ KVa

Hence, 80 KVa is the capacity of the condensers required. As was stated above this may be located in the plant and connected to the outgoing line, connected to the line at some central point, subdivided and connected at central points to the mains serving the wells or an appropriate unit may be set at each motor.

The cost of 460-volt capacitors is about $10.00 per KVa capacity exclusive of the racks and protective equipment and that of 2300- or 4000-volt apparatus about 25 percent less. In the case of the example given above, at 60 percent power-factor the generator is able to carry $156 \times .60$ or 93.6 kilowatt. By increasing the power factor to 90 percent it will carry 140.4 kilowatt. If the additional capacity is needed it is obvious that the expenditure appears to be justified but if it is not, the increase in efficiency of operation alone may not show an actual saving. This will be true especially when gas that has only a book value is used for fuel. It will be found that in general it is not wise to attempt to correct the power factor to much above 95 percent. It works out that the capacity required to raise it from 95 to 100 percent is so great that its cost is out of proportion to the returns.

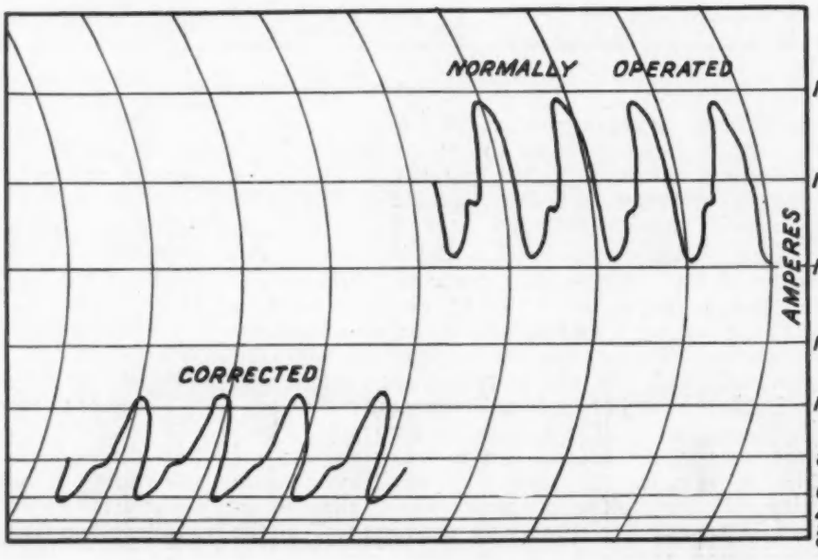


FIGURE 3

That a condenser is effective in reducing the line current is shown by this high-speed chart taken on a pumping well. The well was badly out of balance and the controller of the 15/35-horsepower motor was set on the fifth point of a nine-point control.

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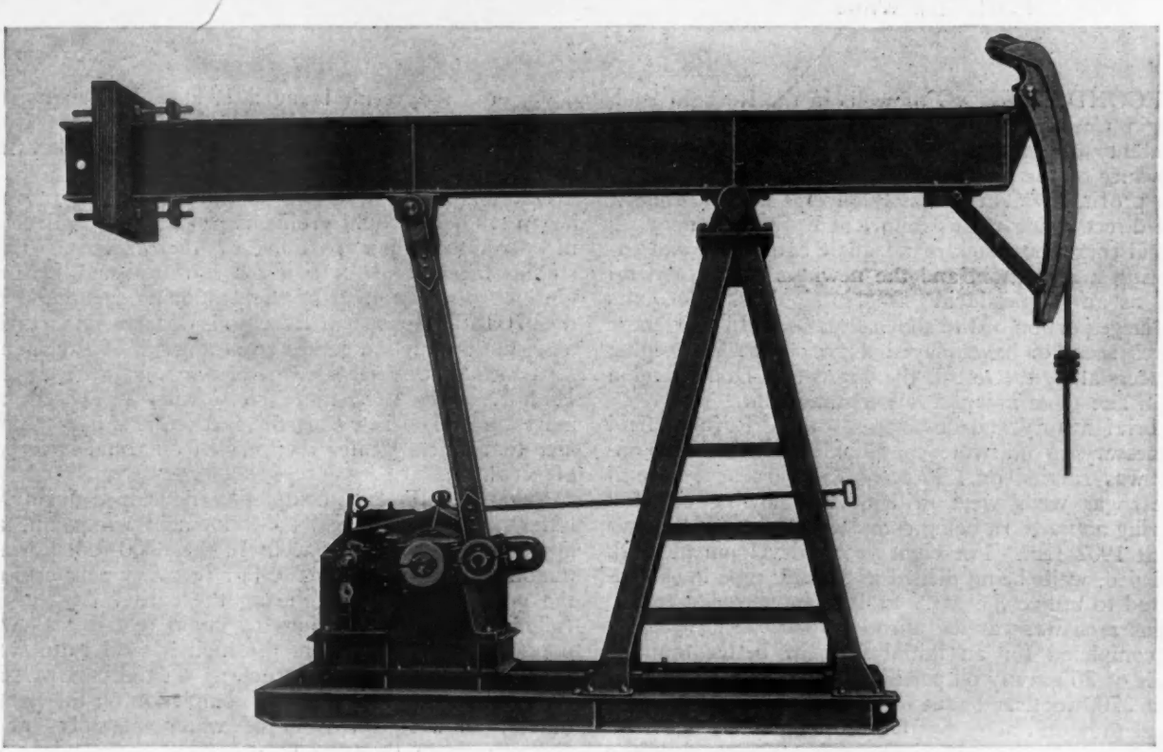

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- Single-well pumping with rotary counterbalance crank.
- Two-well pumping with "V" frame attachment.
- Two- or three-well pumping with back crank equipment.
- Four-well pumping using a beam, "V," and back crank equipment.
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Reconditioning Wells

AT REFUGIO INCLUDES DEEPENING, PLUGGING BACK AND RECOMPLETING

By R. E. McCLUNG,* Independent Operator
and
EARL S. POST, Staff Writer

RECONDITIONING of wells in the Refugio field, Refugio County, brings to light the importance and desirability of anticipating future production problems in advance of the original drilling campaign. A loss of gross profit, involving possibly several million dollars, is the direct result of this failure at Refugio alone.

Local conditions, lack of adequate equipment and engineering information, and the newness of the general trend as an oil producing area, undoubtedly accounts for a large portion of the above situation. In fact, these failures seem to have played a great part in keeping producers along the rest of the Trans-Salt Dome Region well in line from a conservation standpoint.

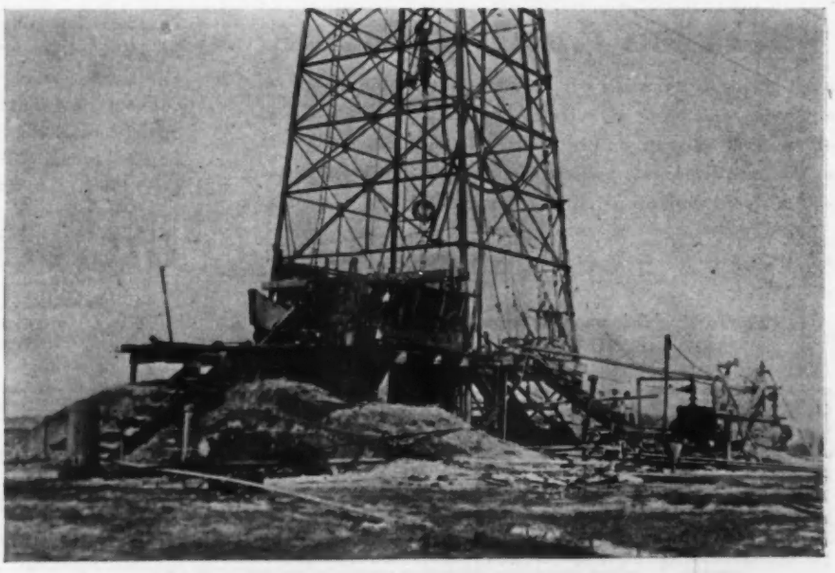
A brief history and description of the Refugio field is necessary to illustrate conditions in which development was carried on. Exactly 15 years ago, several shallow gas wells were drilled, two blowing out and cratering and a third being completed as a large dry gas well at 1902 feet. For eight years, development work proceeded, wells being drilled and trunk pipe lines constructed to utilize the gas. In 1928, however, a test in the gas area was carried ahead to 3702 feet, where it was completed for an initial flow of better than 35 barrels of 26 gravity oil per hour.

The 3700-foot sand zone immediately was spread over several thousand acres by the development rush. Wells were drilled close to lease lines, on small tracts and even on small town lots in the heart of Refugio. The idea was to set up a rig, push the hole down to the sand and to complete a producer in the shortest possible time. Large sand bodies were taken, little coring done, etc., the result being a lack of information on each test, especially above the producing horizon. Some wells were high gas/oil ratio propositions, while others soon went to water.

Development slowed and operators with larger leases began studies of field problems preparatory to development of the inner portions of their leases. These studies brought about a number of unusual features. One was the condition of the producing section. While the 3700-foot horizon at Refugio is of tremendous thickness, the production comes from a series of sand lenses separated by a series of caps and various other breaks. Had the wells been more conservatively spaced, and more care taken in coring the section, it is highly probable that much greater recovery of oil could have been effected.

Revised methods of completion, developed during the latter part of the field's development campaign, and applied some to of the wells in the 3700-foot horizon, undoubtedly account for the fair recovery per acre over the general area. But during the earlier days of the field, hundreds of millions of cubic feet of gas were popped into the air from the high gas/oil ratio wells. The dissipation of the gas energy on the part of some producers and the inadequate completion on the part of others, allowing intrusion of water, possibly cut oil recovery from this one level several thousand barrels

*Mr. McClung formerly was South Texas land man for Independent Oil & Gas Company, which spent several millions of dollars in the Refugio field through lease purchases and drilling operations.



Drilling operation in the 4900-foot zone of the Refugio field.

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per acre. This practice is not looked upon with condemnation, it being the accepted method of production at that time.

Later, a series of discoveries of deeper sands, on down to 6600 feet, brought about additional production problems. To protect offsets, some wells were forced to drill through a dozen or more oil and gas sands to reach the level of the well across the lease line. While some of the sands were cored, the majority were logged only by the driller as the bit passed through the horizon. The condition of the sands and the possibility of them producing oil and gas, or either, in many cases was unknown. The tremendous expense of deep drilling and the size of the acreage held by the smaller operators solved some of the problems in the deep area. Many of the leases were consolidated through purchase, hence much unnecessary offsetting was overcome.

The withdrawal of large volumes of oil by virtue of the wells flowing nearly wide open brought dissipation of much of the energy and the intrusion of formation water. In other words, in taking the "cream" too rapidly, there was little or no "skimmed milk" left.

Now, however, the situation is materially changed in the Refugio field. After several years of production, engineers have been confronted with the situation of finding ways and means of working over dead wells and salvaging the greatest profit from each hole. Their choice is one of three things, deeper drilling to search for lower levels, plug back to upper strata, or re-complete at the present level. The latter has been effective in a few cases, liners and screen being pulled, formation cleaned and washed with oil and the test brought back for fair production. These plans, however, have not been too profitable and what work-over work has been done has been to other producing levels than the ones already producing.

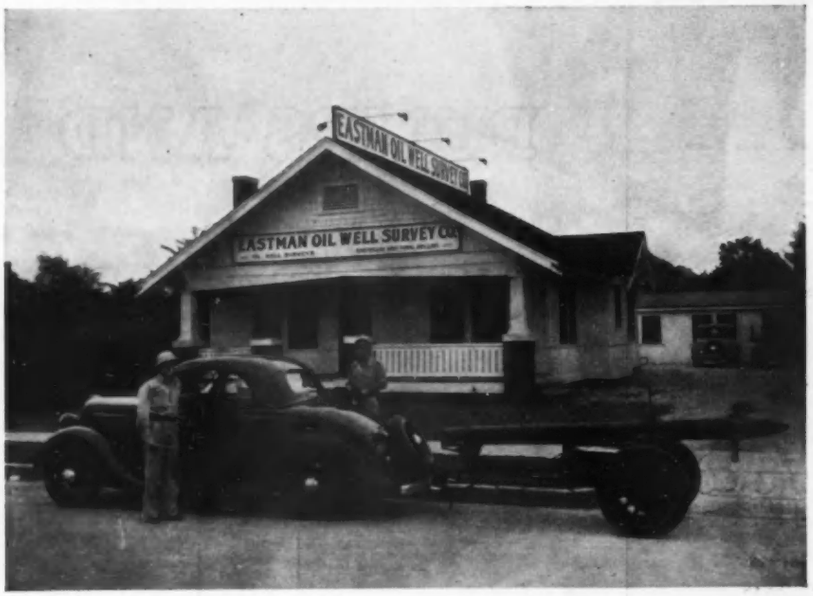
United Production Corporation and Houston Oil Company of Texas have been the most outstanding operators in the field to carry on an appreciable amount of this type of work. They control the majority of the producing property and maintain production and engineering departments in the district.

One case of deepening was in Houston Oil Company's Rooke 11, on the west side of the Refugio field, a dead gasser in the 3600-foot sand. It was carried ahead to 4937 feet, where on May 28, 1934, the company completed it for an initial flow of 760 barrels per day through choke. Several other wells were deepened from shallower levels in this portion of the field.

The main importance of the discovery is that there is a possibility of new producing lenses over the majority of the structure. The individual lens may cover only a limited amount of acreage, but a number of these spotted areas will provide tremendous recovery. It is therefore possible that in the rapid drilling of the Refugio field during the boom days, possible producing sands were passed through, being logged as sandy shale.

In anticipation of other producing horizons at lower levels, a number of the wells drilled in the field set sufficiently large casing on the upper sands to enable deepening with comparative ease. This accounts for the setting of 8¼-inch pipe in so many of the 3600-foot oil wells.

The deeper drilling feature of completions, however, does not enter so greatly into the situation as obtaining information on sections passed through before reaching the final completion level. The majority of the ordi-



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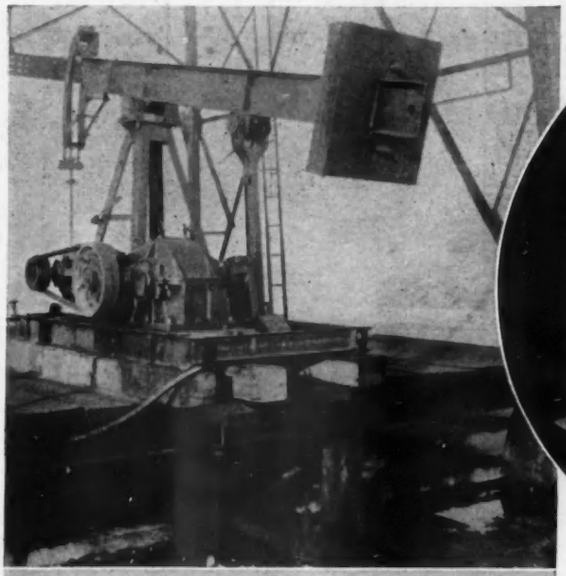
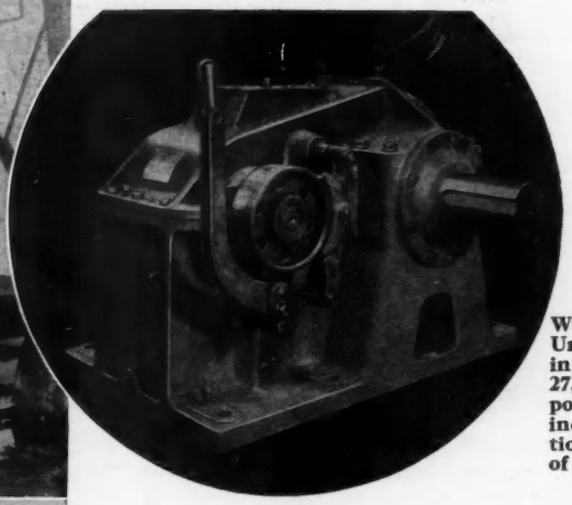


Installation of a Westinghouse OP reduction gear unit. Low cost of installation, minimum wasted power, and extremely low maintenance charges are characteristics of these units.

A typical installation of a twin crank individual pumping power unit, equipped with Westinghouse reduction gear unit.



Westinghouse Gear Units are available in ratings of 10, 20, 27, 35 and 45 horsepower, to meet the individual production requirements of every type of well.

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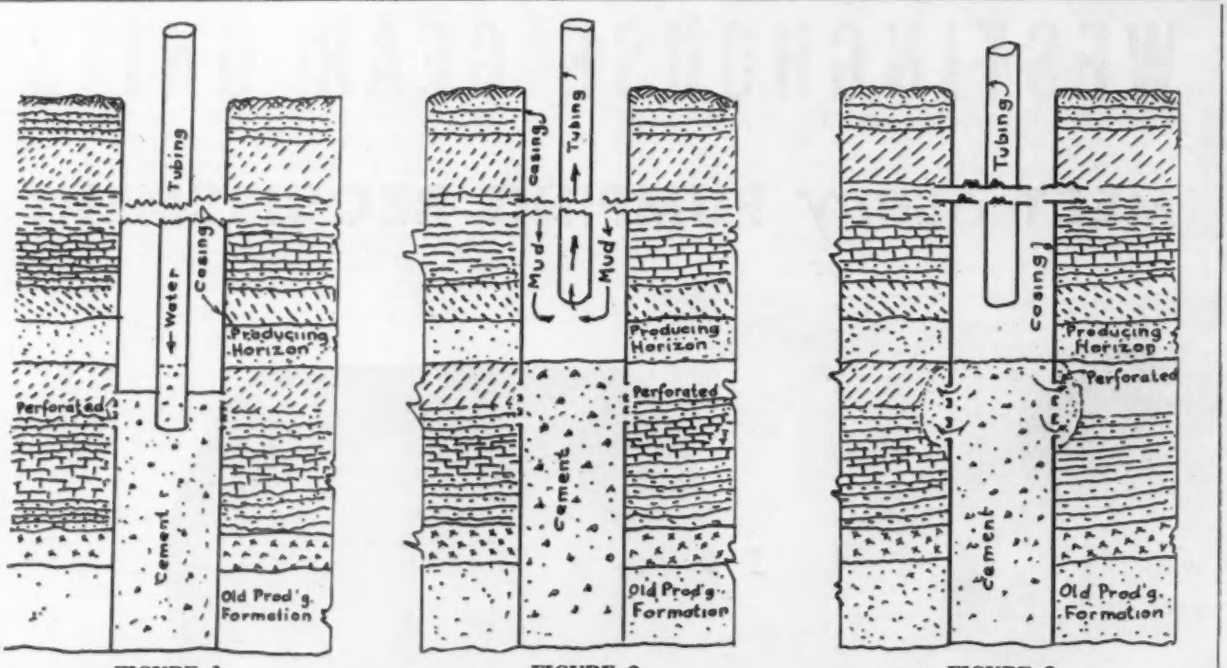

FIGURE 1 **FIGURE 2** **FIGURE 3**

Three stages in the plug back plan now in use at Refugio

nary completions, through seven-inch oil strings, can be carried several thousand feet deeper with comparative ease. The expense of rigging up, and conditioning a 3600-foot hole for deepening, likewise is sometimes as expensive as drilling an entirely new hole. It also is possible that the demand for deepening, by virtue of offsets, may come before the particular level has been depleted of its production.

Plugging Back Practices

In plugging back for production, information is vital. Failure of an accurate log, the difference being only a foot or two, may mean the loss of a producer. Frequently, sands are logged as sandy shale and vice versa, again hindering the completion of a producing well.

A problem in plug back jobs is in the actual completion. Using a 3700-foot well for an example, the test originally was drilled to this level and casing set atop the sand. While the records of amount of cement set have been kept, condition of the hole makes it almost impossible to calculate just how the cement is set in the hole. In some cases, the cement may have been forced above the next producing level, while in others, this is not likely.

The above situation was overcome through a plug back cementing method developed on these wells. While the plan varies slightly, several companies in the field follow the same general practice. This is to gun perforate the casing just below the desired completion point. Tubing is then run into the hole to a point just below the perforations and cement pumped until the desired amount is run into the hole. Immediately following this charge of cement is a quantity of water, then mud. As soon as the last of the supply of cement is near the bottom of the tubing, the tubing is raised above the perforations, this enables the flow of water and mud to circulate above the cement and return through the casing. As soon as circulation is effected and the water removed, the valves on the casing are closed and pressure applied to assure the pushing of the cement through the perforations and into the formation. The purpose of the charge of water is to clear the cement from the tubing. When the cement has set, the same process is repeated to cement above the producing horizon. The cement is then drilled out to below the producing level and gun perforations made in that portion of the hole.

The above cementing plan is successful in cutting off the intrusion of water, mud, etc., from above and below the producing horizon. It also keeps the sand comparatively free of cement. If, however, cement does penetrate the producing horizons, the gun perforating method of completion overcomes this particular obstacle.

Application of modern scientific methods in compiling well information will enable Houston Oil Company of Texas to overcome the above obstacles when it becomes necessary to work over the producers being drilled in the new west flank area. The company has completed a number of 4900-foot producers in this portion of the field during the past year. The area is practically controlled by the one company, enabling a more conservative spacing plan.

As the wells are drilled, the various sands above the 4900-foot level are generally cored. In addition, electric formation logging device is run on the majority of the wells. The carefulness of this operation gives the company a virtually accurate picture of the entire subsurface in the district. The adequate data suggests the opening and closing of various sand lenses, and gives an idea of the points where the best plug back completions can be obtained.

While the field is only 15 years old, its continuous development campaign over that period gives an excellent picture of the advance of oil field engineering during that period of time. Had the present engineering equipment and knowledge been available during the earlier days of the field, there is little doubt but that the recovery would have been far greater, and the profits increased several fold.

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Electrical Logging

EXPERIMENTS DEVELOP ATTACHMENT FOR USE ON ROTARY DRILLING RIGS

By J. C. KARCHER,
Geophysical Service, Inc.,
Dallas, Texas.

ELECTRICAL logging attachment for a rotary drilling rig is the outgrowth of a series of experiments conducted during the years 1930, 1931 and 1932. The results of these experiments are set forth in a paper read at the Dallas meeting of the American Association of Petroleum Geologists in 1934. The outstanding conclusion to be drawn from this series of experiments is that high resistance in a subsurface formation may be due to any one of the four following causes:

1. To the presence of oil in a sand.
2. To the presence of gas in a sand.
3. To the presence of fresh water in a sand.
4. To the fact that the formation itself may be a dry limestone, dolomite, anhydrite, et cetera.

As fresh water sand and limestone are more common than oil and gas sand, it is obvious that very misleading results may be obtained if one attempts to interpret such high resistance areas as being due to the presence of oil and gas.

A practical consideration of the problem shows the desirability of being able to make this differentiation by observation in a third dimension. As a result, the electrical logging attachment for a rotary drilling rig has been devised with a view to attaining this end.

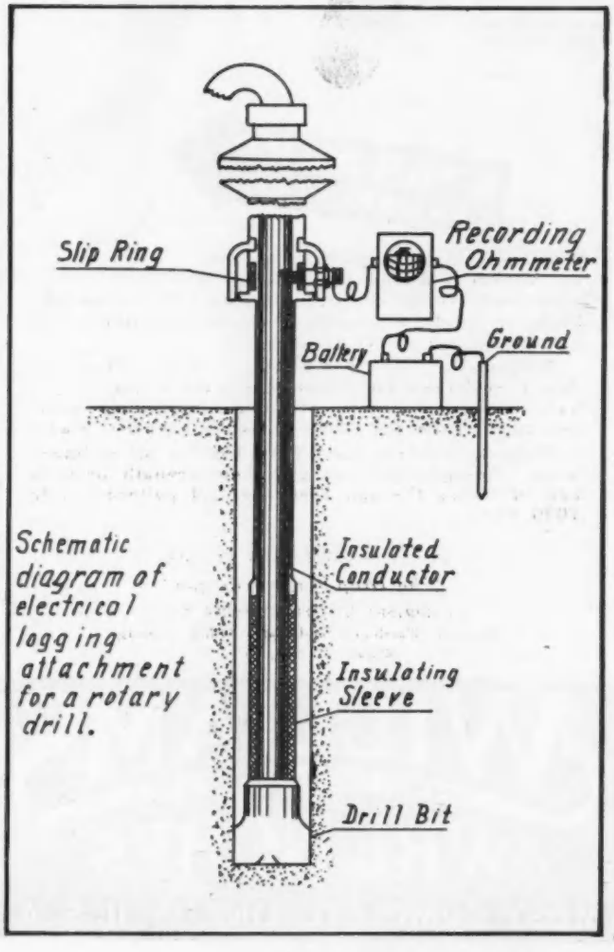
Simple Schematic Arrangement

The electrical arrangement in use is a decidedly simple one, comprising essentially the same procedure as is used in observing the resistance to ground when one drives a conducting stake into the ground and measures the resistance between ground and stake. Instead of using a stake the bit of rotary drilling machine is used.

Figure 1 shows the schematic arrangement. The drill bit is insulated from the drill pipe by means of a tubular section of bakelite about four or five feet long; an insulated conducted rod is mounted in each section of drill pipe and provided at the end for making connection with the conducting rod in the adjacent section as the lengths of drill pipe are joined together. At the top of the Kelly and below the water swivel an insulated slip-ring is provided with a brush for making electrical connection between the conductor and a suitable record-ohmmeter, from which a connection is made to a battery and then to the ground through electrodes placed usually in the slush pit, or by means of a wire attached to the surface casing. The resistance between the surface casing and ground is a constant quantity, and therefore offers no interferences to the observations that are obtained. Usually because of the large area of the surface pipe, this resistance is very low, perhaps only three or four percent of the resistance of the bit to the ground. This is due to the large difference in area between the surface of the bit and the external surface of the surface pipe.

The chart feed on the ohmmeter is geared to the

FIGURE 1



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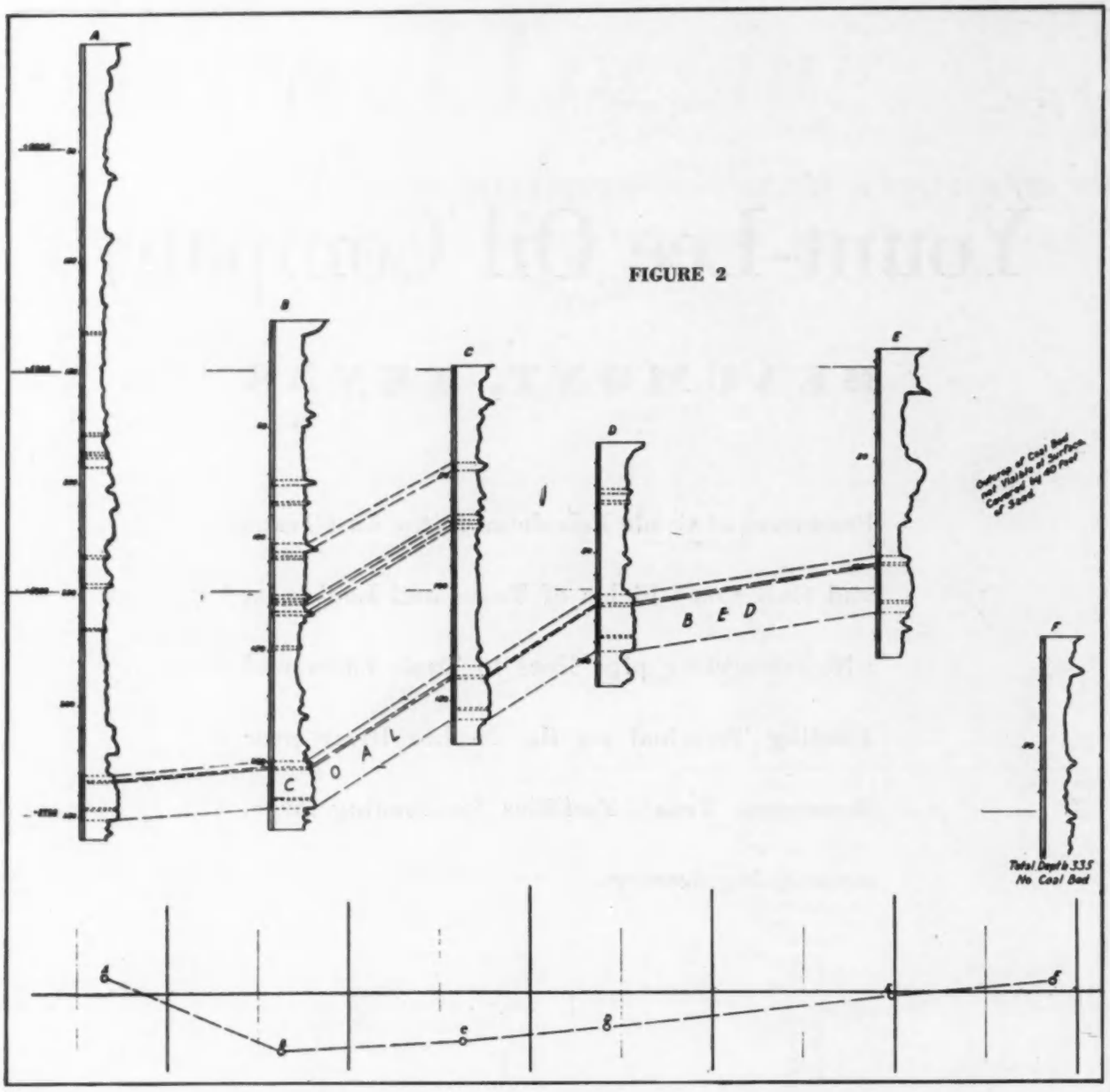

FIGURE 2

hoisting drum of the rotary rig in such a manner that a feed of one-half or one inch per 10 feet, or any other desired rate of feed, may be obtained. A suitable cam and ratchet arrangement is provided in order that the paper of recording meter is moved only when drilling proceeds, thus providing a continuous record of the resistance of the hole and automatically tracing same to scale.

In the first experiments with the electrical logging attachment a series of 78 core holes were drilled in Nueces County, Texas. Subsequently, a series of 83 core holes were drilled in Arapahoe County, Colorado.

Early Experiments

Figure 2 shows the profile of logs of a group of holes drilled in the Arapahoe County project. The outstanding markers in this instance consist of a series of coal beds, locally designated as the Scranton Coal. The solid black on the logs, drawn adjacent to the electrical logs, shows the coal beds as obtained by sampling, which was done in connection with the electrical logging. No cores were taken in this work; only the electrical logs were used and samples caught, the position of each sample determined by comparison with the electrical logs.

Figure 3 shows a series of five holes drilled in the northeast corner of Young County, Texas. These holes were drilled to depths of 450 to 600 feet, and were drilled for the purpose of determining the presence of a sand member beneath the Breckenridge lime in this area.

It will be noted that Lignite beds show a very high resistance. Also, the shallow fresh water sands show high resistances, as do the limestone, particularly when the limestone occurs in the fresh zone.

This illustration will quickly show the limit of the meteoric water zone and the logging of the connate water zone.

It will be observed that there are two oil shows

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in the series of logs. Both of these shows were of too little consequence to be of any commercial value.

Observations to date indicate that these shows are indicated by the recording instruments as soon as the bit has penetrated its length into the formations having the shows. Because of this fact, a comparatively short bit is used, since it is desired to pick up the oil or gas sand as quickly as possible in order that the sand and its contents may be checked by coring.

It is believed the electric logging attachment is able to definitely recognize the presence of an oil or gas sand. For instance, if the bit has penetrated 12 to 18 inches into the sand, drilling is stopped and coring commenced at that point. Therefore, any sand body, which is of sufficient thickness to be of commercial importance, will still be available for coring; and the condition of the bottom of the hole will be suitable for making a drill stem test and for completion of the well.

Figure 4 shows an electrical log wherein a gas show occurred. In this instance the gas show was encountered and drilled into, to the amount just stated, after which a core was taken and a gas sand of rather tight nature was proved to exist. A drill stem test showed it to be of no commercial value, probably due to tightness of the sand. After completion of the test, the drilling of the hole was continued which made it possible to obtain a continuation of the log as shown.

Prior to drilling the well just described, another shallow well was drilled in which a gas sand was encountered at approximately the same depth. The sand was cored and found to be of a suitable characteristic for completion; and, after testing to ascertain the presence of a desirable volume of gas, the well was duly completed as a small gas well. These two wells above described were drilled in Webb County on the Gates Ranch for J. Elmer Thomas, et al.

The rig used to drill these wells was a seismograph shot hole rotary rig; and it was able to drill to a maximum depth of 1360 feet, using the electrical logging attachment.

To date there has been drilled a series of holes consisting of perhaps 200 core holes with an average depth of 250 feet, about 20 holes with an average depth of 500 feet, about 15 holes with an average depth of 1000 feet and several holes to a somewhat greater depth.

Because of the successes in this endeavor, and because of the manner in which the electrical logging attachment has performed, work on its improvement is continuing. Accordingly, a portable rig now is being built with the view of drilling to depths up to 5000 feet.

It is the plan to drill a hole of such a size that it can be completed with small diameter casing to make a commercial well, if desired. In this manner it is hoped to be able to drill exploratory wells, furnishing the maximum amount of information on the subsurface formations, and complete the well if desired.

The project recently completed on the Gates Ranch in Webb County for J. Elmer Thomas et al is one of the most outstanding illustrations of the application of this method exploration. A total of seven

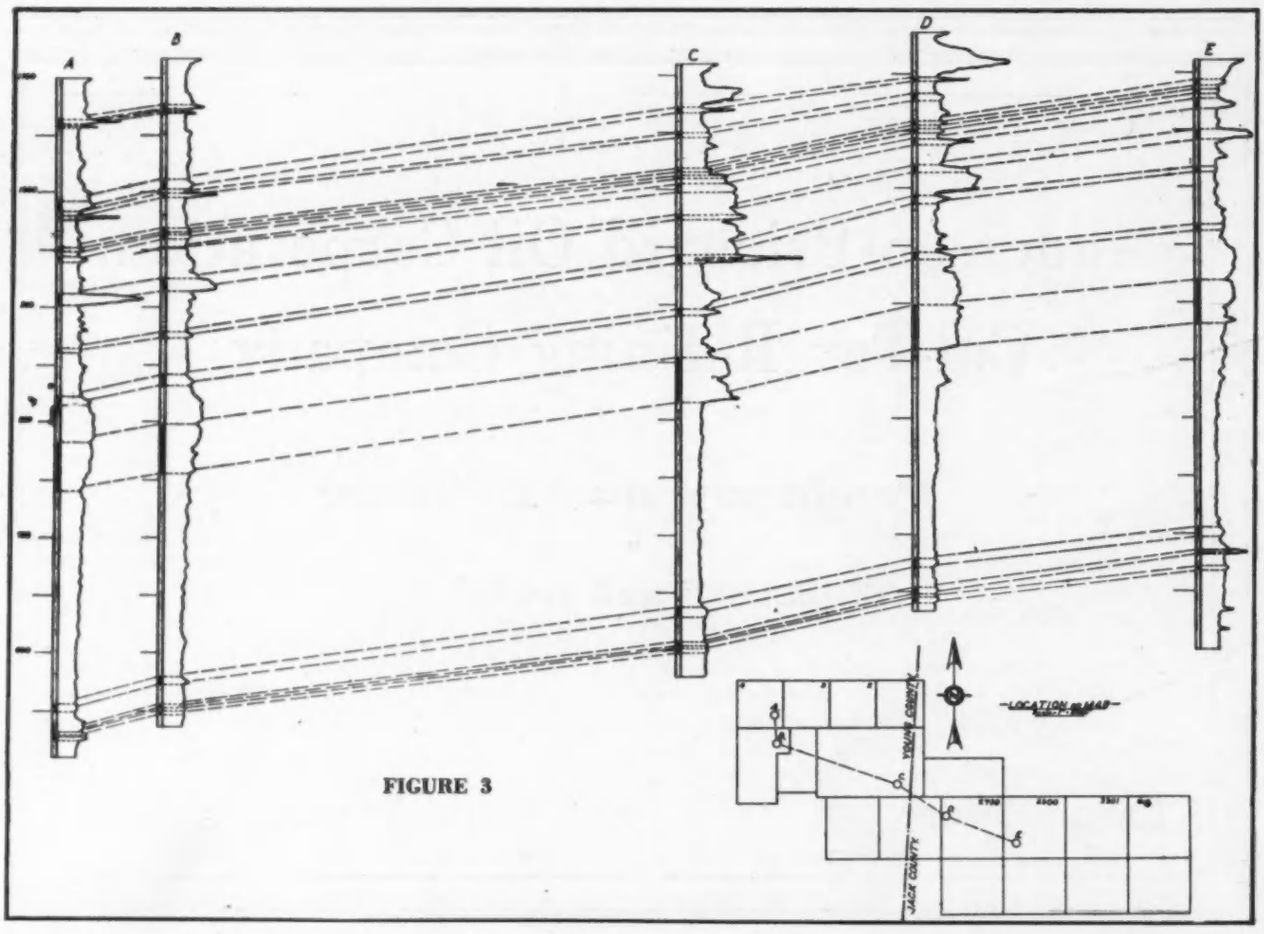
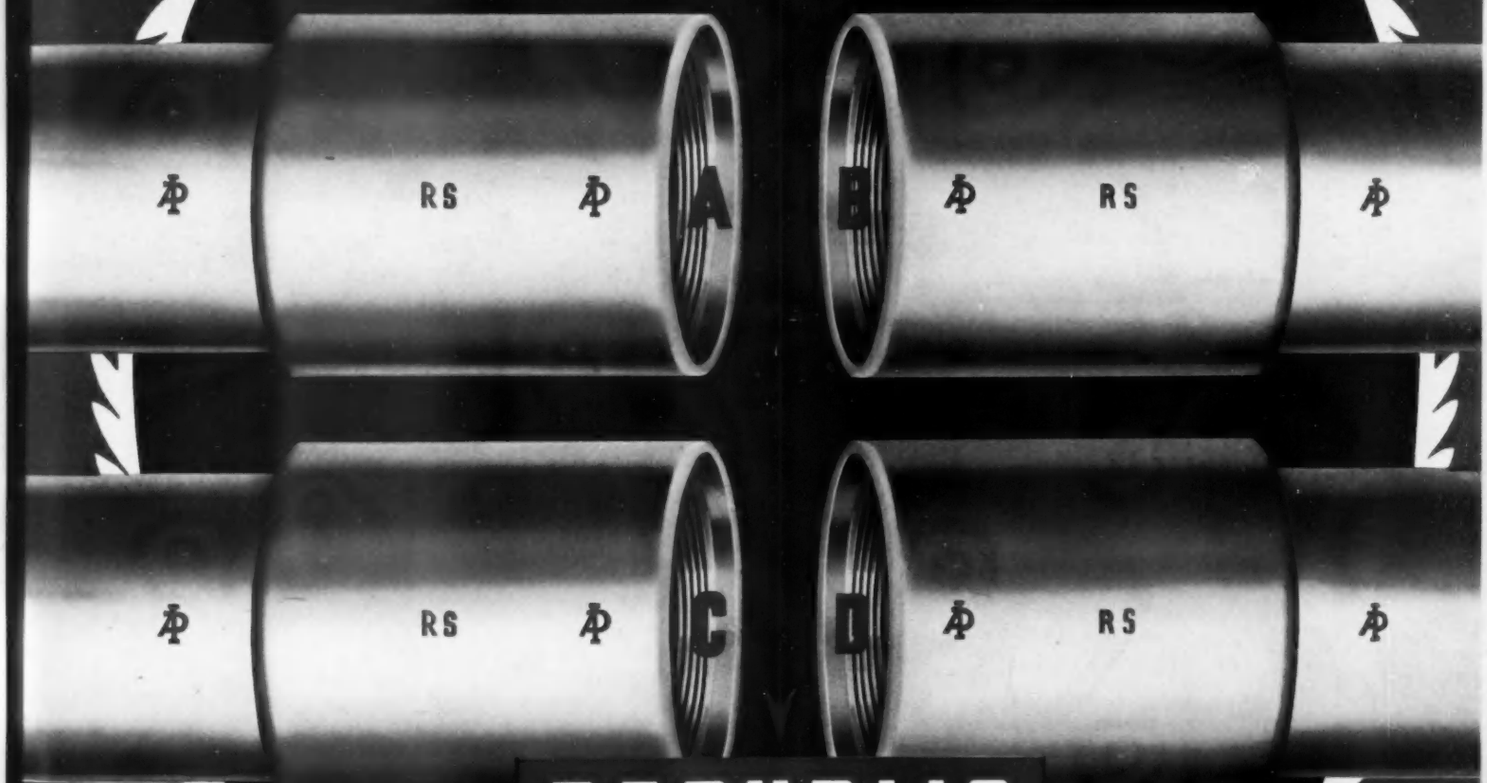


FIGURE 3

A GRADE TO FIT EVERY REQUIREMENT



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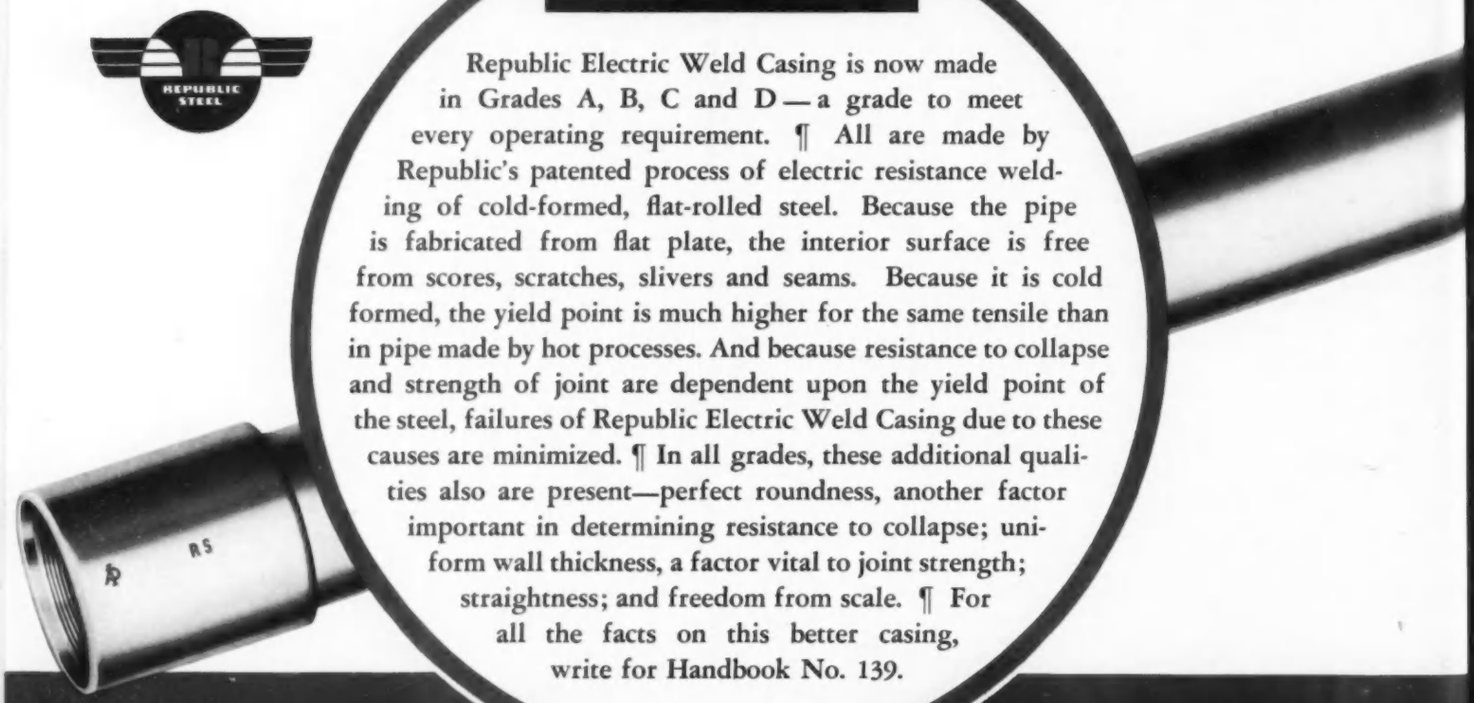

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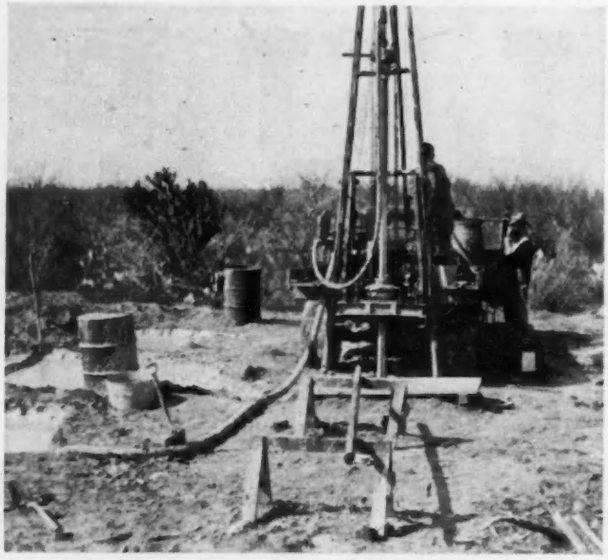
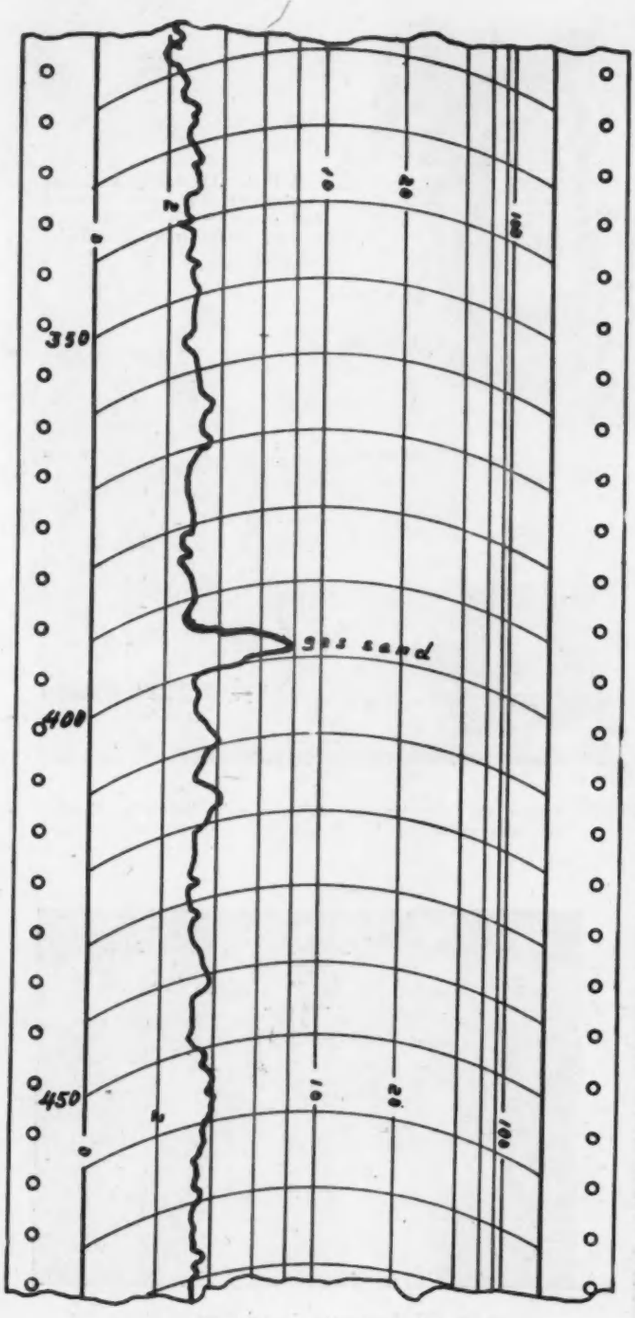
Right: Core drilling equipment with electric coring attachment operating on Gates Ranch



Below: Showing section of ohmmeter record showing a gas sand.



holes were drilled on the block with this equipment.

The first test showed sufficient resistance to indicate a gas producing sand. The drilling was stopped and a drill stem test taken that developed sufficient pressure to warrant setting of casing. The well was completed as a gas producer at 370 feet. This completion shows the flexibility of this equipment, enabling the logging of the well while drilling, in addition to enabling actual completion in a producing horizon.

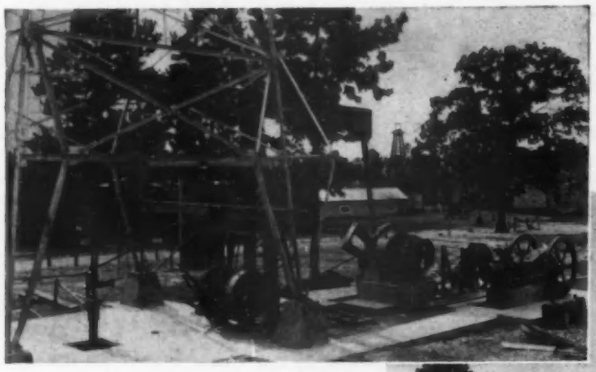
The other tests were drilled, and correlations made on the log charts. The result was the establishment of a closed structure, corresponding very closely to the surface and subsurface work done prior to this drilling operation. A 3000-foot test, to all the usual horizons in the Mirando district, was drilled at the top of the structure. It definitely logged high, as indicated by the correlations, but the lack of sands prevents the possible opening of an oil field.

Of particular notice in these logs was the accurate information available for correlation. Sand lensing is so erratic in this particular area that one lens may open and close over an area of only several locations. Unless wells are closely drilled, it is difficult to correlate these sands. The use of these electrically plotted logs, however, overcome this obstacle to a great degree. The correlation is on certain datum points, rather than on sands. Positive turns and twists in this line on the log chart are constant on every log in a given area. These points are generally marked by a colored pencil after the log has been completed, each being designated as A, B, C, etc. The result is that they can be correlated at these points. The erratic sands, therefore, present no complication, but completely display the subsurface picture.

There are a number of mechanical problems coincident with the electrical problems, but these are being attacked both with sincerity and effort, and it is hoped that this work will solve the mechanical and electrical problems concurrently. For instance, it is known that the problem of hydraulics which enters into drilling rotary holes is one of major importance; and it is hoped to contribute something in this connection to the art of drilling, as well as to develop the method of electrical logging.

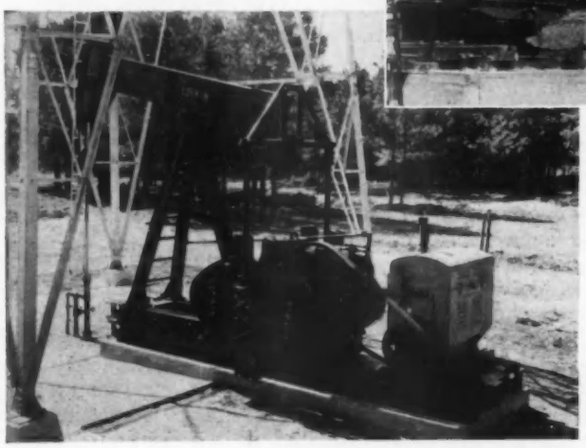
LUFKIN

We present typical "East Texas" Lufkin installations. Users of Lufkin equipment may be found among the smallest as well as the largest operators in this field.

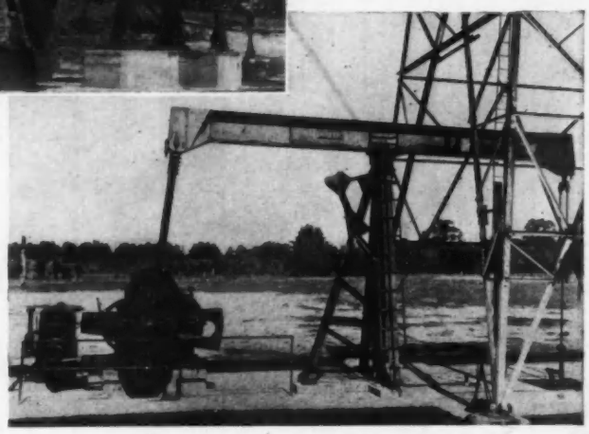


Lufkin No. 56 Heavy Duty Herringbone Unit with Center-line Beam Assembly and No. 6 Rod and Tubing Hoist—single cylinder engine drive. Woodley Petroleum Company, George Thompson No. 3. Twelve such installations for Woodley.

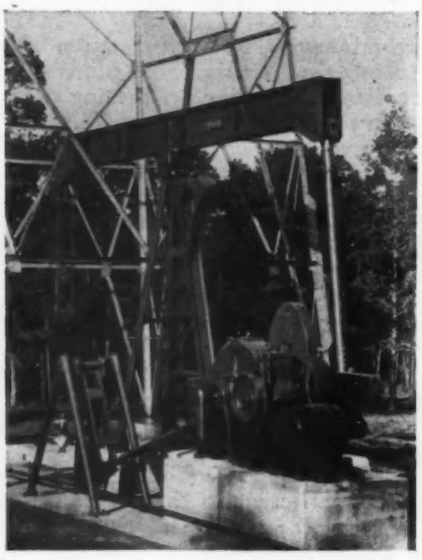
Lufkin No. 31 Double Reduction Herringbone Unit with Standard Post Assembly. Burwyn Oil Company, East London District.



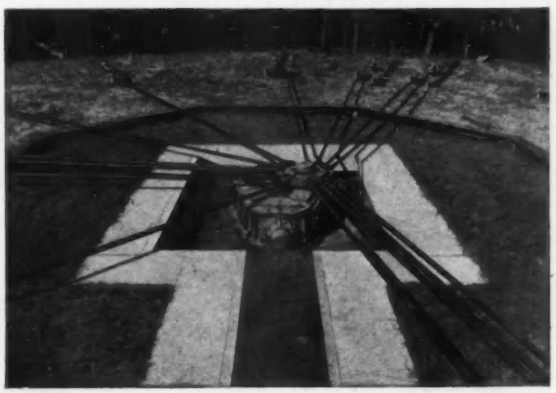
Lufkin Twin Crank Unit Assembly with structural base arranged for gas engine drive. Sinclair Prairie Oil Company, Laurther Lease.



Lufkin No. 48 Herringbone Unit with Center-line Beam Assembly—Stanolind Oil & Gas Company, Cayuga District.

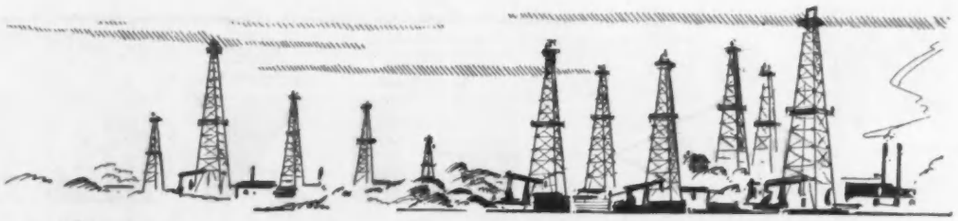


Lufkin No. 58 Herringbone Unit complete with Center-line Beam Assembly and arranged for "Back-side" crank pumping of two extra wells — see details of crank arrangement on next page. Lechner & Hubbard, Castleberry Lease.



Lufkin No. 150 Herringbone Central Pumping Power, Tide Water Oil Company, Castleberry Lease near Spring Hill.

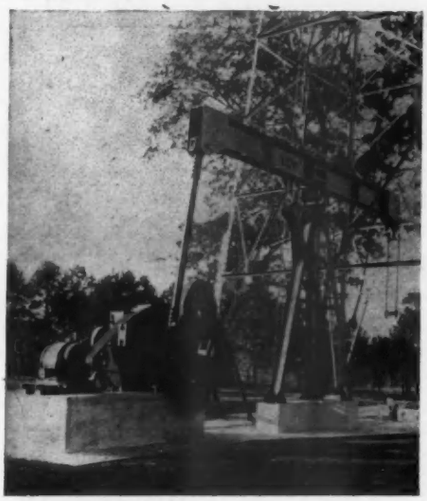
in



East Texas

EAST TEXAS OPERATORS AGREE ON "LUFKIN" AS THE DESIRABLE EQUIPMENT FOR LONG RANGE OPERATION

Lufkin No. 3-18 Twin Crank Unit complete assembly. Cherokee Chief Oil Company, Todd No. 1, Gladewater area.



"Back-side" crank installation of Lufkin No. 58 Herringbone Unit for Lechner & Hubbard, Castleberry Survey, East Texas. Note: Lufkin "Underpull" Swing Take-off.

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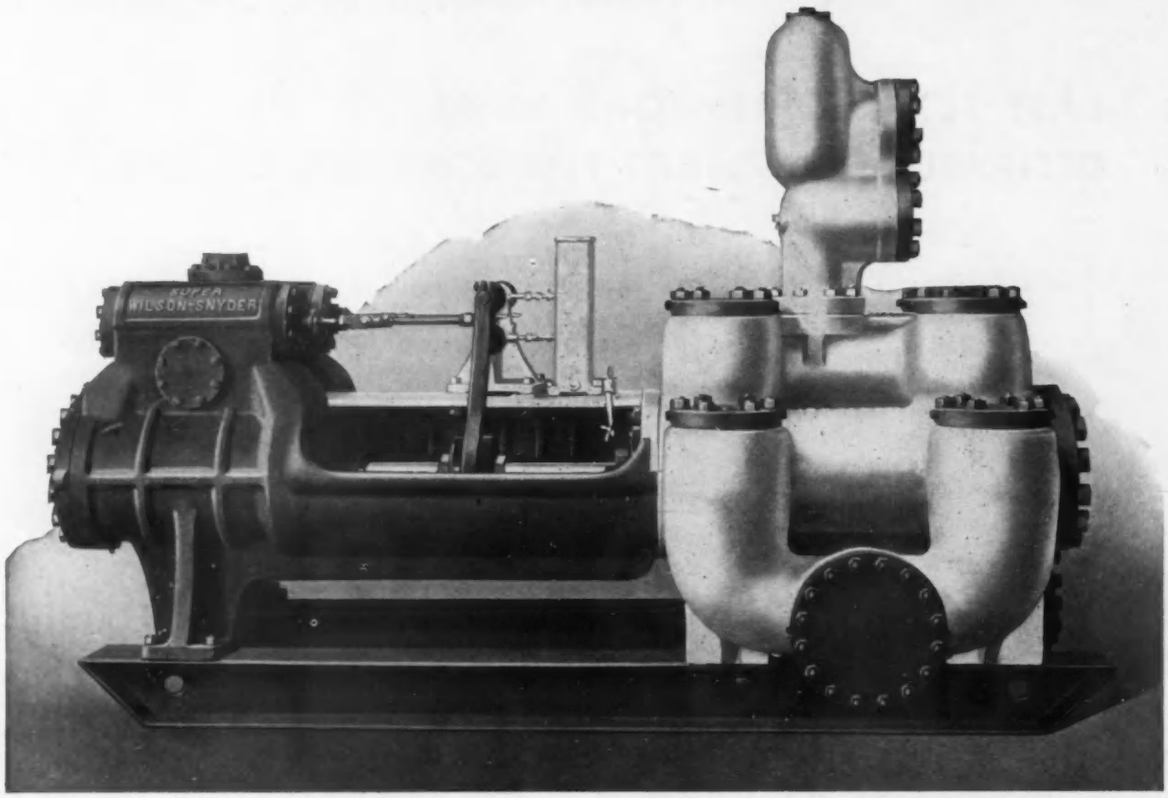

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VARIOUS WEAK SPOTS GIVE CAUSE FOR SOME ANXIETY

THE market situation has continued unsettled, although there have been some signs of improvement.

Considerable anxiety has persisted in the wake of the minor, localized crude price cuts of the past few weeks in Pennsylvania and South Texas. For in some other areas the crude output is too high to be absorbed readily, and the markets involved have consequently softened.

In East Texas, particularly, production is not being controlled with enough effectiveness to promote firm markets. For considerable time there has been a gradual increase in the volume of hot oil producing and refining in the district, and finally, that excessive output has begun to affect the general Mid-Continent market, as well as the markets within Texas.

Outside of East Texas, areas in the Mid-Continent in which the crude markets appear to be somewhat soft include the Texas Panhandle, West Texas, the Texas-Louisiana Gulf Coast, and South Texas. In the latter district, which produces primarily low gravity oil, suitable for making lubricants, the prices were cut five cents a barrel recently. With various new fields lately discovered, the district was producing more oil than there was ready demand for.

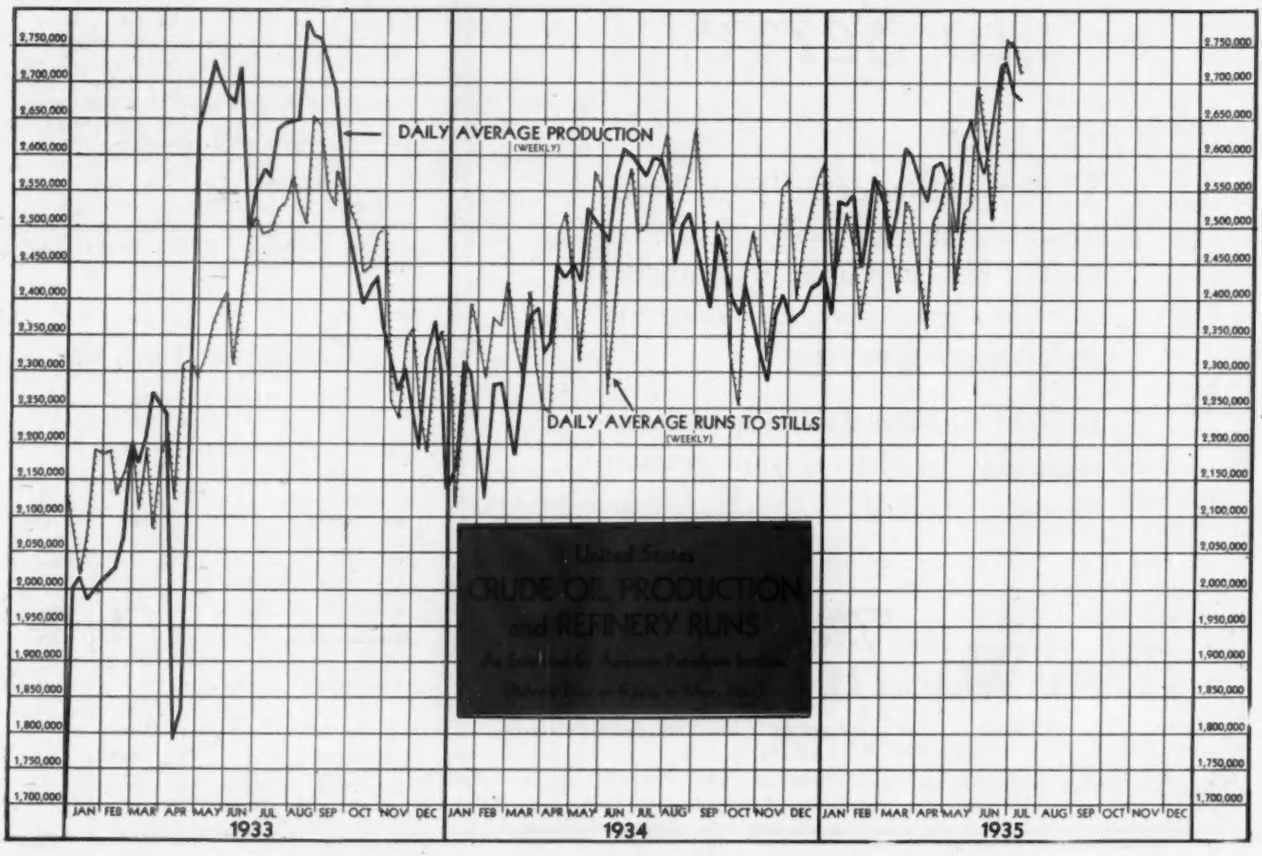
California Troubles

California also represents an especially soft spot in the national market situation. Crude prices are being held unchanged there, as producers strive to hold output within reasonable bounds through voluntary proration. But there is, nevertheless, substantial overproduction of crude; and refined product prices are consequently still depressed in the southern portion of the state. Some hope is offered, however, in the circumstance that the crude production control has proved more successful in the fore part of July than in the first part of June. It is hoped that the proration program will show enough improvement to cut excess crude down to low proportions, and to stimulate the sub-normal gasoline prices.

Hot Oil in East Texas

In East Texas the output of hot oil was indicated last week to be around 35,000 barrels daily, which was somewhat higher than in the preceding week. Aggravating the situation in East Texas is the fact substantial quantities of confiscated products have been placed on the markets. The state, under a new law, has been confiscating oil held to be of illegal production origin. Offered at public auction, the oil has been bought back generally by the original owners at low bids, with other prospective buyers afraid of entering bids, under threats of being sued if the confiscation law proves invalid. Products confiscated and sold in this manner have tended to surfeit the markets and to exert unfavorable influence on prices.

Meanwhile, there has continued the substantial volume of traffic in the ordinary hot gasoline and other products, moving to markets within Texas by trucks, and without the tenders that



are needed for rail shipment. These truck shipments involve prices substantially below the tank car market prices. In the areas to which the trucks move, retail prices have continued depressed, postings being as low as 11 cents a gallon, including 5 cents taxes, in some instances.

Favorable Factors

Despite the softness of the crude market in spots, and the various anxieties and disturbing factors, there have been some decidedly favorable circumstances. For instance, there has been a material increase in demand for products, as the summer travel period is well under way.

Also, in the face of pessimistic talk regarding the crude market, there was improvement last week in tank car prices on some grades of gasoline in the Mid-Continent, while other grades remained steady. At the middle of the week, the prices for all grades of tenderable gasoline in East Texas stood one-eighth cent per gallon higher than one week previously. In North Texas the third and premium grades were each up one-eighth cent, while the standard grade was unchanged. In Group Three (Oklahoma) area, the two lower grades were unchanged, while the premium grade was off an eighth cent.

The new prices on U. S. motor gasoline in East Texas were as follows: third grade, below 62 octane, 4⅝ cents a gallon; standard grade, 62-67 octane, 5 cents; and top grade, 68-70 octane, 5⅜ cents. In North Texas the three grades were priced at 4⅝, 5, and 5⅝ cents; and in Oklahoma at 4⅝, 5⅛, and 5½ cents.

Kerosene prices have continued to decline. They have been on the downward trend for six weeks, due apparently to the seasonal factors, and in the meantime have come down a full cent on the gallon. The going price last week was 2⅞ cents a gallon in East Texas, 3⅛ cents in North Texas, and 3 cents in Oklahoma.

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CUTTING SERIOUS

East Texas situation is becoming dangerous

PRICE cutting by East Texas refiners is assuming dangerous proportions. Plants operating on untendered products and those fortified with several million barrels of crude and refined products repossessed after being confiscated by the state are staging price wars that forced tank truck sales of gasoline to the two-cent level the past week. This fight has resulted in a few cities within trucking distance of the refining centers receiving nine-cent retail prices including five cents in taxes.

Repossessed Oil

The quantity of products repossessed by the plants that make a specialty of evading state and federal regulations is sufficient to break down the retail price structure over a large portion of the state. State approved tenders are automatically granted to plants that buy in their confiscated oil after paying nominal fees to the state, thus making it possible for the finished products to be moved via tank cars to marketing centers beyond reach of the tank truck operators. Considerable gasoline was sold the past week by plants using repossessed products for rail movement within the state at three cents per gallon. This price threatens to go lower with each succeeding sale of hot oil by the state to the original owners after confiscation suits are consummated. Twenty plants in East Texas were qualified for federal tenders on their products derived from legally produced crude as a sequel to a federal court ruling making it compulsory for the federal board to pass on legally produced co-mingled oil. Heretofore the board has turned thumbs down on all applications involving the contamination of legally produced oil with that of a questionable source.

Accounted for illegally produced crude averaged about 30,000 barrels daily the past week according to observers, with all plants averaging 62,500 barrels daily throughput.

East Texas Tank Car Shipments

Week Ending July 7, 1935

PRODUCTS	No. Cars	Estimated Gallons
Gasoline	599	4,883,900
Fuel Oil	236	2,206,105
Casinghead Gasoline	185	1,581,494
Distillate	65	526,798
Kerosene	62	498,944
Gas Oil	45	371,275
Topped Crude	29	271,331
Crude Oil	26	230,604
Naphtha	15	118,235
Residuum	11	89,486
Total	1,273	10,778,172
Total Previous Week	1,374	11,694,027
Interstate	552	.....
Coastwise	366	.....
Intrastate	355	.....
Total	1,273	.....

PRODUCTION HIGHER

Output in United States 37,225 barrels greater

UNITED STATES crude oil production last week, ending July 13, was 37,225 barrels per day higher than in the previous week, and 53,800 barrels per day more than the indicated daily demand, as calculated by the Department of the Interior. The output for the week averaged 2,713,800 barrels daily.

Oklahoma production was almost within the indicated demand for that state. Kansas produced less than its demand. Texas output was within suggested limits, in so far as recorded production was concerned, although there was probably around 35,000 barrels hot oil output daily in East Texas, not counted in the state's production. In California, production continued excessive, despite efforts to make the voluntary proration program of the state effective. Louisiana output continued at a comparatively high level, as in the past.

The production rate for Oklahoma was 521,375 barrels daily, or about 4000 barrels per day more than the Department of Interior calculation. In the previous week, the state's output had been 30,000 barrels a day lower.

Kansas averaged 146,575 barrels daily last week, which was about 1000 barrels more than in the previous week, but roughly 9000 barrels less than the indicated demand for the state's oil.

Texas Drops Back

Texas production dropped back about 8000 barrels from the previous week's daily output, having averaged 1,058,000 barrels daily, exclusive of hot oil, or about 6000 barrels per day less than the indicated demand.

California's output last week, averaging 562,000 barrels daily, was 15,000 barrels per day higher than in the previous week.

Louisiana production was 400 barrels a day lower than in the preceding week, having averaged 139,800 barrels daily.

STOCKS DECLINE

Natural gasoline output and stocks drop in May

NATURAL gasoline production continued its steady decline in May. The daily average for the month was 4,179,000 gallons, or 100,000 gallons below the average in April. These figures are from the report for May by the Bureau of Mines.

In the Panhandle the daily average production increased slightly, while the output in East Texas rose to a new high level. In the Oklahoma City and Kettleman Hills fields production was materially lower.

Stocks of natural gasoline at refineries declined during May. But that decline was more than offset by seasonal increases at plants and terminals.

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	BARRELS DAILY FOR WEEK ENDING July 13	July 6
TEXAS—		
Texas Panhandle	60,100	60,500
North Texas	59,200	59,150
West Central Texas	25,500	25,550
West Texas	155,800	153,700
East Central Texas	49,800	50,100
*East Texas Field	459,000	469,500
South Texas	59,500	63,100
Texas Gulf Coast	189,100	185,100
*Total Texas	1,058,000	1,066,700
OKLAHOMA—		
Oklahoma City	164,725	137,075
Seminole Area	134,450	125,227
Tatums	5,000	5,000
Lucien	10,100	10,275
Fitts	9,775	16,925
Edmond	4,900	.....
Others	192,425	197,073
Total Oklahoma	521,375	491,575
KANSAS—		
Ritz-Canton	7,200	8,050
Voshell	4,625	4,200
Nikkel-Hollow	7,700	7,475
Sedgwick	7,675	8,950
Burrton-Haury	20,050	22,650
Lorraine	4,775	.....
Others	94,500	93,875
Total Kansas	146,575	145,200
LOUISIANA—		
North Louisiana	22,300	22,700
Louisiana Gulf Coast	117,500	117,500
Total Louisiana	139,800	140,200
ARKANSAS	30,850	31,000
CALIFORNIA—		
Long Beach	76,000	74,000
Santa Fe Springs	40,000	38,500
Huntington Beach	45,500	41,500
Dominguez	19,000	21,500
Inglewood	10,500	11,500
Ventura Avenue	29,000	28,500
Seal Beach	7,500	7,000
Midway-Sunset	54,000	54,500
Elwood	12,500	15,000
Kettleman Hills	62,500	60,000
Mountain View	26,500	21,500
Playa del Rey	21,000	23,000
Others	158,000	150,500
Total California	562,000	547,000
MOUNTAIN STATES—		
Wyoming	39,200	38,800
Montana	10,900	10,200
Colorado	4,100	4,100
Total Rocky Mountain States	54,200	53,100
NEW MEXICO	53,100	52,800
EASTERN STATES	105,200	105,800
MICHIGAN	42,700	43,200
*Total United States	2,713,800	2,676,575
*Surreptitiously produced oil in East Texas, not included in above figures, estimated at	35,000	30,000
Grand Total, including surreptitious production	2,748,800	2,706,575

Crude Runs to Stills; Finished and Unfinished Gasoline; Gas and Fuel Oil Stocks, and Cracked Gasoline Production, Week Ended July 6, 1935

(Figures in thousands of barrels of 42 gallons each)

DISTRICT	Daily Refining Capacity of Plants			Crude Runs to Stills		Stocks of Finished Gasoline			(a) Stocks of Unfinished Gasoline	(b) Stocks of Other Motor Fuel	Stocks of Gas and Fuel Oil	Daily Charging Capacity of Cracking Units			Cracked Gasoline Production
	Potential Rate	Reporting		Daily Average	% Operated	At Refineries	Bulk Term in Trans. & Pipe Lines	Total at Refys. Term., etc.				Potential Rate	Reporting		Daily Average
		Total	%										Total	%	
East Coast	612	612	100.0	492	80.4	5,777	9,918	15,695	777	260	11,494	534	469	87.8	87
Appalachian	154	146	94.8	101	69.2	1,233	879	2,112	301	145	823	79	78	98.7	21
Ind., Ill., Ky	442	424	95.9	380	89.6	5,633	3,731	9,364	772	55	4,703	349	338	96.8	128
Okla., Kans., Mo.	453	384	84.8	273	71.1	3,008	2,298	5,306	640	545	4,555	256	228	89.1	66
Inland Texas	330	160	48.5	100	62.5	1,048	112	1,160	234	1,325	1,744	148	105	70.9	26
Texas Gulf	617	595	96.4	538	90.4	4,757	250	5,007	2,007	295	10,204	399	393	98.5	130
Louisiana Gulf	169	163	96.4	125	76.7	659	590	1,249	229	.....	3,877	77	74	96.1	19
North La.—Ark	80	72	90.0	47	65.3	193	85	278	50	90	387	46	44	95.7	6
Rocky Mountain	97	60	61.9	46	76.7	900	.....	900	101	55	801	46	39	84.8	11
California	852	789	92.6	462	58.6	7,202	1,865	9,067	1,021	3,010	63,279	274	274	100.0	64
TOTALS WEEK: July 6, 1935	3,806	3,405	89.5	2,564	75.3	30,410	19,728	50,138	6,132	5,780	101,867	2,208	2,042	92.5	558
June 29, 1935	3,806	3,405	89.5	2,601	76.4	30,418	19,589	50,007	6,098	5,785	101,818	2,208	2,042	92.5	535

Below are set out estimates of Crude Runs and Cracked Gasoline Production on B. of M. Basis for Week ended July 6, 1935 compared with July 1934 Bureau figures.

Estimate B. of M. Basis July 6, 1935	2,715		610
Estimate B. of M. Basis June 29, 1935	2,750		585
U. S. B. of M. July, 1934: Daily Average Crude Runs	2,575	U. S. B. of M. July, 1934: Daily Average Cracked Prod.	532

(a) Amount of Unfinished Gasoline contained in Naphtha Distillates.
(b) Estimated. Includes Unblended Natural Gasoline at refineries and plants; also Blended Motor Fuel at plants.

MART UNCERTAIN

California gasoline war continues, outlook better

THE general market in California continues most uncertain. Early last week, gasoline prices were again reduced to lower levels in the San Joaquin Valley, following a raise to normal prices about two weeks previous. Too much cut-price gasoline was moving into that area from Los Angeles. In the area from Santa Barbara south to San Diego, low gasoline prices continue to prevail.

So far the price war has not gained much foothold in the general San Francisco area, but the number of independent stations selling at less than usual and normal prices is slowly increasing.

Comparison of Permits Granted for New Wells

STATE—	Week Ending July 6	Total this Mo.	Total this Year	Total this Date Last Year	1934 Year Total
Arkansas	...	...	17	31	100
California	34	34	506	274	629
Louisiana	21	21	432	424	799
Kansas	17	17	532	511	1,015
Michigan	19	19	266	246	460
Oklahoma	53	53	1,169	1,126	2,045
Texas	273	273	5,767	5,550	10,550
Total	417	417	8,688	8,162	15,598

If the price war gets much headway in that part of the state, a cut in price of crude oil probably will be forced, although a very large percentage of the producers are trying to head off a posted price cut through efforts to hold production of crude down as much as possible.

The one optimistic thought is the failure of crude oil production to climb as high the first five days in July as it did in the same period in June. Production mounted to 568,313 barrels July 2, but dropped down to about 560,000 barrels on July 3 and 4. On July 5, the production was 563,849 barrels. If the producers and others interested are able to hold production to about 550,000 barrels a day the first half of the month, the situation may be saved. Also every effort is being made by the leading producers to keep any of their fellow producers from selling any crude to any refiner at less than posted price. As the result of these efforts, about a dozen small plants are shut down, since they find it impossible to run their plants at present net back for gasoline.

It is understood a tanker is enroute Los Angeles Harbor from East Coast to be loaded with cheap gasoline to be moved to ports in Washington and Oregon. If this plan succeeds, it is possible the price war will extend into these two states.

Small refiners are having fair success in moving their fuel oil locally in tank cars at about 65 cents a barrel, but fuel oil for export cannot be purchased at less than 75 to 80 cents a barrel. At these prices, no sales have been reported. It is understood companies with most of the fuel oil stocks are not worried over the future, and they refuse to sell at a price not to their satisfaction. In a few weeks, the Navy will be asking bids on 3,000,000 to 4,000,000 barrels of fuel oil. Naturally this business will go to West Coast concerns, as the oil must be delivered to the fleet in Pacific waters.

WEST KANSAS LINE

Continental to build six-inch west Kansas system

Ponca City.—Continental Oil Company is reported buying right-of-way for a six-inch oil pipe line between Valley Center in northern Sedgwick County and a central point in Russell County, a distance of approximately 115 miles. Stanolind Pipe Line Company has the only pipe line into the area which has been under intensive development for several months and in which a number of nice pools have been found. Due to limited outlet the wells in the area have an accrued underage of approximately 200,000 barrels and several of the operators have been discussing the building of a 5000-barrel refinery at the town of Russell. According to the report more than 6000 barrels of production per day has been pledged to Continental.

CRUDE OIL PRICE QUOTATIONS

(Figures Represent Basic or Flat Prices—Revised to July 12, 1935)

DISTRICT	Low Grav.	Dif.	High Grav.	Date
Oklahoma-Kansas	28—$ .84	2¢	40—$1.08	9-29-33
N. and N.-C. Texas	28— .79	2¢	40— 1.03	9-29-33
Texas Panhandle				
Gray County	34— .79	2¢	40— .91	9-29-33
Carson-Hutchinson	34— .69	2¢	40— .81	9-29-33
West Texas				
Ector, Pecos, Wk'lr	*.75			9-29-33
Crane, Upton, Howard and Glasscock	*.70			9-29-33
East Texas	*1.00			9-29-33
Texas Gulf Coast				
Conroe	35— 1.09	2¢	40— 1.19	9-29-33
Tomball	*1.15			9-29-33
Cleveland	*1.00			1-11-34
†Goose Creek, Hull Liberty, Orange, Pierce Junction, Moss Bluff, Raccoon Bend, Sour Lake, Spindletop, Sugarland, West				
West Columbia,	Below			
Humble, Rabbs Ridge	20— .82	2¢	34— 1.12	9-29-33
South and S.W. Texas	Below			
Refugio (Light)	20— .82	2¢	34— 1.12	9-29-33
Refugio (Heavy)	*.80			6-29-35
Saxet	*.80			6-29-35
Mirando	*.75			6-29-35
Pettus	*1.05			9-29-33
Salt Flat	*.87			9-29-33
Darst Creek	*.87			9-29-33
Arkansas				
El Dorado (Light) and Rainbow	29— .79	2¢	40— 1.03	3-17-34
El Dorado East Field and Smackover	*.70			9-29-33
North Louisiana	29— .79	2¢	40— 1.08	9-29-33
Urania	*.85-*.87			1- 1-34
South Louisiana	Below			
Lockport	20— .80	2¢	34— 1.10	9-29-33
	Below			
Iowa, Cameron Mds	20— .70	2¢	34— 1.00	9-29-33
Rocky Mountain States				
Salt Creek	29— .84	2¢	40— 1.08	9-29-33
Elk Basin	*1.17			9-29-33

* All gravities—flat rate.
† Gulf Coast prices as posted by Humble Oil & Refining Company.

DISTRICT	Low Grav.	Dif.	High Grav.	Date
Grass Creek (Light)	*$1.17			9-29-33
Big Muddy	*1.01			9-29-33
Rock Creek	*1.02			9-29-33
Sunburst	*1.35			9-29-33
Lance Creek	*1.02			8-25-33
Osage	*.62			8-25-33
Cat Creek	*.45			8-25-33
Pondera	*.65			8-25-33
Hog Back, N. M.	*1.00			9- 8-33
Lea County, N. M.	*.75			9-29-35
Mid-West States				
Lima	*1.15			2- 1-35
Illinois	*1.13			1- 5-34
Princeton	*1.13			1- 5-34
Western Kentucky	*1.13			5-22-35
California				
Signal Hill	14— .65	1¢	16— .66	9- 6-33
	17— .69	2¢	22— .84	9- 6-33
	23— .88	3¢	30— 1.09	9- 6-33
Seal B., Alamitos Hts.	19— .65	3¢	20— .68	9- 6-33
	21— .72	4¢	22— .76	9- 6-33
	23— .81	4¢	26— .93	9- 6-33
	27— .98	4¢	30— 1.10	9- 6-33
Huntington Beach	14— .65	4¢	15— .69	9- 6-33
	16— .72	3¢	19— .81	9- 6-33
	20— .83	3¢	28— 1.07	9- 6-33
	29— 1.09	3¢	30— 1.12	9- 6-33
Inglewood	14— .65	4¢	16— .73	9- 6-33
	17— .76	4¢	18— .80	9- 6-33
	19— .83	4¢	20— .87	9- 6-33
	21— .90	4¢	22— .94	9- 6-33
	23— .97	4¢	24— 1.01	9- 6-33
Playa del Rey	14— .65	1¢	15— .66	9- 6-33
	16— .69	4¢	17— .73	9- 6-33
	18— .76	4¢	19— .80	9- 6-33
	20— .83	4¢	21— .87	9- 6-33
	22— .90	4¢	23— .94	9- 6-33
	24— .97	3¢	25— 1.00	9- 6-33
			26— 1.04	9- 6-33
Olinda-Brea Canyon	14— .65	4¢	16— .73	9- 6-33
	17— .76	3¢	28— 1.10	9- 6-33
Athena-Rosecrans: Domingues	23— .83	3¢	24— .86	9- 6-33
	25— .90	4¢	26— .94	9- 6-33
	27— .97	3¢	29— 1.04	9- 6-33
	30— 1.08	4¢	31— 1.12	9- 6-33
			32— 1.15	9- 6-33
Elwood (fob ship)	33— 1.03	3¢	37— 1.15	9- 6-33
Torrance	14— .65	1¢	15— .66	9- 6-33
	16— .69	3¢	20— .81	9- 6-33
	21— .83	3¢	26— .98	9- 6-33

* All gravities—flat rate.

DISTRICT	Low Grav.	Dif.	High Grav.	Date
Richfield	15—$ .65	2¢	16—$ .67	9- 6-33
	17— .70	4¢	20— .82	9- 6-33
	21— .85	4¢	22— .89	9- 6-33
	23— .93	4¢	24— .97	9- 6-33
	25— 1.00	4¢	27— 1.08	9- 6-33
	28— 1.11	4¢	29— 1.15	9- 6-33
Whittier-LaHabra	15— .65	3¢	18— .74	9- 6-33
	19— .78	3¢	24— .93	9- 6-33
Montebello	19— .65	1¢	20— .66	9- 6-33
	21— .69	3¢	22— .72	9- 6-33
	23— .76	4¢	24— .80	9- 6-33
	25— .85	4¢	26— .89	9- 6-33
Coyote Hills	16— .65	3¢	19— .74	9- 6-33
	20— .78	3¢	29— 1.05	9- 6-33
	30— 1.09	3¢	34— 1.21	9- 6-33
Santa Fe Springs	21— .72	4¢	22— .76	9- 6-33
	23— .79	4¢	25— .87	9- 6-33
	26— .90	4¢	28— .98	9- 6-33
	29— 1.01	4¢	30— 1.05	9- 6-33
	31— 1.08	4¢	33— 1.16	9- 6-33
	34— 1.19	4¢	35— 1.23	9- 6-33
	36— 1.26	4¢	38— 1.34	9- 6-33
New Hall, McKittrick, Kern River	14— .57		19— .57	9- 6-33
Midway-Sunset, Elk Hills, Buena Vista Hills	17— .57	4¢	18— .61	9- 6-33
	19— .64	3¢	22— .73	9- 6-33
	23— .77	4¢	33— 1.17	9- 6-33
Lost Hills	17— .57	4¢	21— .73	9- 6-33
	22— .76	3¢	30— 1.00	9- 6-33
Coalinga	17— .57	1¢	18— .58	9- 6-33
	19— .62	3¢	21— .68	9- 6-33
	22— .72	3¢	25— .81	9- 6-33
Wheeler Ridge	17— .57	1¢	18— .58	9- 6-33
	19— .61	3¢	25— .79	9- 6-33
Kettleman Hills	33— .93	3¢	39— 1.11	9- 3-33
Pennsylvania				
Bradford	*2.05			6-26-35
Sw. Pa. Pipe Line	*1.77			6-26-35
Eureka Pipe Line	*1.72			6-26-35
Buckeye Pipe Line	*1.62			6-26-35
Corning Grade	*1.32			10- 2-33
Michigan				
Central Michigan	*1.20			9-30-33
Muskegon	*.70-1.00			12-31-32
Canada				
Petrolia	*2.10			9- 9-33
Oil Springs	*2.17			9- 9-33

* All gravities—flat rate.

Summary of Wells Completed in the United States

Week Ending July 6, 1935

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total Completions 1935	Total Completions this date 1934
Alabama	...	...	...	...	.....	3	2
Arkansas	1	...	...	1	.....	86	33
California	14	9	1	4	9,750	413	196
Colorado	...	...	...	...	.....	6	9
Illinois	...	...	...	...	.....	9	8
Indiana	...	...	...	...	.....	92	83
Kansas	23	10	1	12	7,055	708	448
Kentucky	12	10	1	1	645	85	61
Louisiana	14	6	2	6	1,540	388	358
Michigan	14	9	3	2	4,775	233	238
Mississippi	...	...	...	...	.....	12	16
Montana	5	5	...	...	1,005	61	63
New Mexico	5	4	....	1	3,465	143	51
New York	...	...	...	...	.....	...	4
Ohio	39	13	7	19	365	735	470
Oklahoma	44	27	1	16	49,895	1,198	1,038
Pennsylvania	...	...	...	...	.....	70	160
Texas	204	153	3	48	545,615	6,154	4,998
Utah	...	...	...	...	.....	...	3
West Virginia	13	...	9	4	.....	253	212
Wyoming	3	3	...	...	335	31	22
Total this week	391	249	28	114	624,445	10,681	8,480
Total last week	453	313	34	116	781,145	...	...
Total this year	10,681	7,032	898	2,761	19,805,410	...	...

MAJOR PRICE CHANGES

	Penna. (Nat. Tr.)	Mid-Cont. (36 Gr.)	Calif. (26 Gr.)
March 5, 1933	.....	.....	Cut 24
May 2, 1933	.....	Cut 19	.....
May 9, 1933	Cut 20	.....	.....
May 22, 1933	Up 10	.....	.....
June 19, 1933	Up 10	Up 19	.....
June 26, 1933	Up 10	.....	Up 9-12
July 6, 1933	Up 13	Up 10	.....
July 17, 1933	Up 15	.....	.....
July 28, 1933	Up 15	.....	.....
August 11, 1933	Up 10	.....	.....
August 24, 1933	.....	Up 10	.....
August 30, 1933	Up 15	.....	.....
September 6, 1933	Up 10	Up 10	Up 15
September 8, 1933	.....	Up 15	.....
May 1, 1934	Up 10	.....	.....
November 6, 1934	Cut 25	.....	.....
December 6, 1934	Cut 25	.....	.....
January 4, 1935	Up 15	.....	.....
February 4, 1935	Up 15	.....	.....
May 16, 1935	Cut 15	.....	.....
June 26, 1935	Cut 15	.....	.....

CRUDE PRODUCTION TAXES

Oklahoma—Five percent of gross value less royalty interest.

Texas—Two cents or 2 percent, whichever is higher.

Louisiana—From four to 11 cents a barrel, depending upon gravity.

Arkansas—2.6 percent of gross market values.

Montana—Three percent of gross value at well and ½-cent per barrel.

Wyoming and New Mexico—Production tax based upon state and county assessments.

California—.66443 mills per barrel of oil produced and 17.39 cents per acre on proved oil lands.

Crude Runs to Stills; Finished and Unfinished Gasoline; Gas and Total Oil Stocks, and Gasoline Production, Week Ended July 6, 1935

(Figures in thousands of barrels or 42-gallon units)

District	Daily Refining Capacity of Plants Reporting			Crude Runs to Stills		Stocks of Finished Gasoline			Stocks of Unfinished Gasoline	Stocks of Gas Oil and Fuel Oil	Stocks of Crude Oil	Daily Capacity of Operating Units			Crude Runs to Stills
	Reporting	Total	%	Total	%	Finished	Blended	Total				Reporting	Total	%	
TOTAL WEEK ENDED JULY 6, 1935															
TOTAL WEEK ENDED JUNE 29, 1935															

MART UNCERTAIN

California gasoline war continues, outlook better

THE general market in California continues most uncertain. Early last week, gasoline prices were again reduced to lower levels in the San Joaquin Valley, following a move to restore prices above two cents previously. Low price enterprise gasoline was moving into that area from Los Angeles. To the area from Santa Barbara south to San Diego, no gasoline prices changes appeared.

So far the price war has not gained much foothold in the general San Francisco area, but the number of independent stations selling at less than posted and normal prices is slowly increasing.

Comparison of Permits Granted for New Wells

State	Week Ended July 6, 1935	Week Ended June 29, 1935	Week Ended July 7, 1934	1935 to Date	1934 to Date
Total					

In the price war going south-eastward in that part of the state, a cut in price of crude oil probably will be forced, although a very large percentage of the producers are trying to head off a price cut by efforts to hold production of crude down to small proportions.

The one optimistic thought in the future of crude oil production is cited in the fact that for the first two days in July (as it did in the same period in June) production remains at 96,31- barrels. July 2, however, dropped down to about 96,000 barrels on July 3 and 4. On July 5, the production was 363,849 barrels. If the producers and others interested are able to hold production to about 350,000 barrels a day for the first half of the month, the situation may be saved. Also every effort is being made by the leading producers to keep any of their fellow producers from selling any crude for any time at less than posted price. As the result of these efforts, about a dozen small plants are shut down, since they find it impossible to run their plants at present net back for gasoline.

It is understood a tanker is enroute to Los Angeles Harbor from East Coast to be loaded with cheap gasoline to be moved to ports in Washington and Oregon. If this plan succeeds, it is possible the price war will extend into these two states.

Small refiners are having fair success in moving their fuel oil locally to users at about 65 cents a barrel, but fuel oil for export cannot be purchased at less than 75 to 80 cents a barrel. At these prices, sizeable tonnages have been reported. It is understood companies will store all the fuel oil stocks they can control over the future, and they refuse to sell at a price not to their satisfaction. In a few weeks, the Navy will be asking bids on 3,000,000 to 4,000,000 barrels of fuel oil. Naturally the interests will go to West Coast companies, as the oil must be delivered to the Pacific coast.

WEST KANSAS LINE

Continental to build six-inch west Kansas system

Ponca City—Continental Oil Company is reported having authorized to construct oil pipe line between Valley Center in northern Sedgwick County and a central point in Kiowa County, a distance of approximately 115 miles. Stanolind Pipe Line Company has the only pipe line into the area which has been under intensive development for several months and in which a number of rank pools have been found. Due to limited outlet the wells in the area have an average production of approximately 200 barrels and several of the operators have been increasing the holdings of 500-barrel refinery at the town of Bowers. According to the report more than 600 barrels of production per day has been pledged to Continental.

CRUDE OIL PRICE QUOTATIONS

(Figures Represent Base or Flat Prices. Revised to July 13, 1935)

DISTRICT	Gravity	Price	Diff.	Gravity	Price	Date
[illegible]-Kansas	[illegible]	[illegible]	2¢	[illegible]	[illegible]	[illegible]
[illegible] and N.-C. Texas	[illegible]	[illegible]	2¢	[illegible]	[illegible]	[illegible]
Texas Panhandle:						
Gray County	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]-Hutchinson	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
West Texas:						
[illegible]		*.70				[illegible]
[illegible], Upton, [illegible] and Glasscock		*.70				[illegible]
East Texas		*1.00				[illegible]
Texas Gulf Coast:						
[illegible]	[illegible]	1.00	2¢	[illegible]	1.32	[illegible]
[illegible]		*1.15				[illegible]
[illegible]		*1.00				[illegible]
[illegible] Creek, Hull, Liberty, Orange, [illegible], [illegible] Bluff, Raccoon Bend, [illegible] Lake, Spindletop, Sugarland, West, West Columbia, Humble, Rabbs Ridge	Below 20—	.82	2¢	34—	1.12	6-29-35
South and S.W. Texas:						
[illegible] (Light)	Below 20—	.82	2¢	34—	1.12	6-29-35
[illegible] (Heavy)		*.80				6-29-35
[illegible]		*.80				6-29-35
[illegible]		*.75				6-29-35
[illegible]		*1.05				6-29-35
Salt Flat		*.87				6-29-35
[illegible] Creek		*.87				6-29-35
Arkansas:						
El Dorado (Light) and Rainbow	29—	.70	2¢	40—	1.02	9-17-34
El Dorado East Field and Smackover		*.70				6-29-35
North Louisiana	29—	.79	2¢	40—	1.08	6-29-35
[illegible]	*.85–*.87					1-1-34
South Louisiana:						
Lockport	Below 20—	.80	2¢	34—	1.10	6-29-35
[illegible], Cameron Mds.	Below 20—	.70	2¢	34—	1.00	6-29-35
Rocky Mountain States:						
Salt Creek	29—	.84	2¢	40—	1.08	6-29-35
Elk Basin		*1.17				6-29-35

* All gravities—flat rate.
† Gulf Coast prices as posted by Humble Oil & Refining Company.

* All gravities—flat rate.

Summary of Wells Completed in the United States Week Ending July 6, 1935

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	[illegible]	[illegible]
Alabama	...	...	...	...			
Arkansas	1	...	...	1			
California	14	9	1	4	[illegible]		
Colorado	...	...	...	...			
Illinois	...	...	...	...			
Indiana	...	...	...	...			
Kansas	23	10	1	12	[illegible]		
Kentucky	12	10	1	1	[illegible]		
Louisiana	14	6	2	6	[illegible]		
Michigan	14	9	3	2	[illegible]		
Mississippi	...	...	...	...			
Montana	5	5	...	...	[illegible]		
New Mexico	5	4	...	1	[illegible]		
New York	...	...	...	...			
Ohio	30	11	7	12	[illegible]		
Oklahoma	44	27	1	16	[illegible]		
Pennsylvania	...	...	...	...			
Texas	204	153	3	48	[illegible]		
Utah	...	...	...	...			
West Virginia	13	...	9	4			
Wyoming	3	3	...	...	[illegible]		
Total this week	391	249	28	114	[illegible]	[illegible]	[illegible]
Total last week	453	313	34	106	[illegible]		
Total this year	10,681	7,032	666	2,981	[illegible]		

Pipe Line Activity

NEW PROJECTS— CONSTRUCTION PROGRESS

28-MILE LINE

Plymouth field to get a needed market outlet

San Antonio.—Work is to be rushed on Republic Pipe Line Company's line from the Plymouth field, San Patricio County, to The Texas Company's bunker station at the Corpus Christi deep water port. The line will be approximately 28 miles long and will be perfectly straight, except for one sharp turn. It will cross Nueces Bay enroute. The line will be in operation before September 1.

The pump station is to have two units of electric motor-driven centrifugal pumps, with one as a standby. The single unit to be used will have a capacity of 9000 barrels daily. The line's capacity can be increased to 15,000 barrels by combining the pump power.

New Market Development

The construction of this pipe line brings to light some interesting market developments. The Texas Company is said to have made an agreement with Republic Oil Refining Company, crude purchaser, to take all over 5000 barrels of oil put through the line daily. The 5000 barrels of crude is to go to the Republic Oil Refining Company's plant at Texas City via tanker.

The Texas City refinery has apparently found a need for this additional oil to supply the demands of the Republic Oil Corporation's 875 retail outlets in the vicinity of Pittsburgh.

Republic Oil Corporation on June 1 took over Shell Oil Company's stations in the Pittsburgh area. In addition, the concern secured storage facilities for 5,000,000 gallons of gasoline at the refinery near Pittsburgh recently purchased from Waverly Oil Company.

This combination of deals and developments will establish a continuous system for shipping of crude and refined products from spot where produced to retail market by pipe line and water. Gasoline will be moved from the Texas City plant to New Orleans by tanker, where it will be reloaded onto barges and brought up to Pittsburgh. It is estimated that 20,000,000 gallons of gasoline will be handled annually.

The Republic and Plymouth concerns are associated in the Benedum and Trees group, providing an excellent set-up for controlling production of crude oil to correspond with refined market outlet.

The new Plymouth field in San Patricio County, controlled almost entirely by Plymouth Oil Company, is considered an unusually large reserve and will ultimately recover many millions of barrels of high gravity crude.

NEW OUTLETS

Will be provided for the South Texas valley area

Brownsville, Texas.—Additional pipe line and refinery facilities have been announced for the Port Isabel-Brownsville deep water channel, shortly to be opened to the marine traffic of the world. The newest announcement is the second refinery and third pipe line development to be contemplated for the immediate area as the result of the new deep water port.

Samfordyce Line

The pipe line, extending from the Samfordyce field to the deep water channel, a distance of between 85 and 90 miles, will be constructed immediately for Valley Pipe Line Company, Dallas, just formed. The concern has been incorporated by G. L. Rowsey, Harris A. Melasky and Ben H. Harrison. Also, said to be associated in the project are E. M. Clousit, T. Frank Murchison, and H. H. Hensley, the latter being vice president and general manager. Rio Grande Valley offices already have been established at McAllen.

The second project is a 5000-barrel refinery on the Port Isabel turning basin for the Valley Port Refining Company of which Rowsey is president.

Deep Water Terminal

The third new project is a crude oil deep water terminal to be known as the Port Isabel Terminal Company. It will be headed by Rowsey as president. The concern has received bunkering rights at the port and will construct a complete crude oil loading and storing plant. Contract for its construction has been let to Wyatt Metal and Boiler Works of Dallas and Houston, and construction will start immediately.

The same construction company has been awarded the contract for the 5000-barrel refinery, and engineers are at work surveying the property preparatory to commencement of actual construction. Both projects will involve an expenditure of between $300,000.00 and $350,000.00.

Rowsey is president of Taylor Refining Company, Taylor, Texas. He is interested in several of refinery and crude oil handling and marketing projects in South Texas.

The pipe line project will be started immediately and will be ready for operation in about 50 days. The line is to be 5½ inches in diameter and is to be connected with dresser couplings. One pump station will be constructed at the Samfordyce field, and a second about the midway point of the line. Two 10,000-barrel and four 5000-barrel tanks will be built at the field. The project is to involve an expenditure of in excess of $300,000.00.

Changes Situation

An odd situation arises with the announcement of the newest pipe line and refinery project. The Samfordyce, Mercedes, Barbacoas, Cuevitas, Rio Grande City and Los Olmos fields combined do not have a daily output exceeding 6000 barrels. Except for the Mercedes field, the proven areas of each seem to be apparently defined, and at their best will likely provide no more than 100 more producers. On the basis of that many new producers, increased allowables in the present fields, it is barely possible that more than 1200 barrels daily settled production could be developed.

Ralph E. Fair et al, Cortez Oil Corporation and the Rowsey group have announced plans for the construction of three trunk lines with a combined capacity of fully 25,000 barrels per day. Likewise, they have announced plans and are commencing work on several refinery projects to handle better than 12,000 barrels of crude per day.

Extensions Expected

The above suggests one of two things, either this development is based on anticipation of an extensive development and exploration campaign, or else these companies plan to enter other fields for source of crude supply. This may suggest that an announcement will be forthcoming in the near future of plans for the extension of at least one of these lines from Samfordyce to the production in Starr County, thence to the lower Mirando district.

The Mirando district a few days ago suffered a five cent cut in oil prices, followed by a material decrease in allowable. Both were based on failure of pipe line facilities and over crowded oil market on low gravity crudes. Mirando oils are of a low gravity, but contain a high anti-knock quality. The gasoline can be recovered through cracking. It is possible that a market for this type of crude is now being developed by these pipe line companies, who will make further advances as outlet increases.

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A Setting for Profits

[Continued from page 14]

of 1935 the lubricants demand has been greater than in 1934, 1933, and 1932; but it has not equaled the records for 1931, 1930, 1929, and 1928.

After totaling 9,447,000 barrels in the first five months of 1928, the demand for lubricants rose in 1929 to an all-time peak of 9,691,000 barrels, a record which still stands. In the first five months of 1930 the demand declined to 9,445,000 barrels, then to 8,965,000 barrels in 1931, to 7,449,000 barrels in 1932, and finally to a minimum of 6,117,000 barrels in 1933, which represented a net decline of 37 percent from the 1929 peak. In the first five months of 1934 the lubricants demand rose back to 7,977,000 barrels, and in 1935, to 8,192,000 barrels. This year's demand is about 34 percent above the depression minimum of 1933, but it is running about 15 percent lower than the 1929 peak.

Supply Being Expanded Prudently

With demand around record levels, supply has necessarily been expanded in 1935 as well as in 1934. In expanding supply, however, both restraint and judiciousness have been practiced. Toward the end that stabilization should be maintained, there has been proper recognition of the three potential sources of supply: domestic production, imports, and storage.

For several years the guiding aim has been to reduce stocks, which were considered excessive. To promote that aim, it has been sought to restrict domestic production and imports rigidly, and to meet part of the demand from stored supplies. The records for the past eight years, embodied in the accompanying table, show that these general aims have been carried out with remarkable success.

Production and Imports Restricted

In the first five months of 1929 the total new supply of all oils (domestic production and imports) aggregated 472,711,000 barrels. Thereafter, there was a steady curtailment of the new supply, which fell to 455,441,000 barrels in the first five months of 1930; to 404,466,000 barrels in the similar period of 1931; to 392,256,000 barrels in 1932; and finally to a depression low-mark of 384,916,000 barrels in 1933. Then as demand turned back upward, the new supply rose to 403,928,000 barrels in the first five months of 1934, and to 431,892,000 barrels in the similar period of 1935. By virtue of the better demand, it has been possible to expand the total of new supplies (production and imports) to the highest proportions since 1930, while still permitting further reduction of stocks. It should be pointed out, in this connection, that the imports have continued comparatively low, and that domestic producers primarily have benefited from the better demand, increase of their output having been permissible.

With domestic production and imports restricted consistently even below the declining demand, stocks were steadily reduced throughout the depression. And as demand has turned back upward, the new supplies (domestic production and imports) have continued to be held under market requirements, permitting continuation of the long-sustained reduction of stocks.

Stocks Decline Steadily

On the accompanying table, figures on stocks are as of the end of May in each year. They show that the stocks of all oils reached a peak of 700,412,000 barrels on May 31, 1930, and that they have been reduced substantially every year since then. On May 31, 1935, they stood at 568,340,000 barrels, having come down 132,072,000 barrels, or nearly 19 percent, from the 1930 peak. In climbing up to the 1930 peak, the stocks had been expanding rather rapidly during 1929, 1928, and 1927. However, in that pre-peak period, one must go back to May 1927, to find a figure on stocks lower than that for May, 1935. (By the end of June, 1927, the rising stocks were higher than at present). Thus stocks have been cut back down to the levels of eight years ago.

A break-down of the stocks figures into crude oil, natural gasoline, and refined products is available only back to May 31, 1931. Since then crude oil stocks have been reduced by a net amount of 60,413,000 barrels, or 15 percent. The crude in storage May 31, 1931, aggregated 398,972,000 barrels. The total dropped to 368,039,000 barrels May 31, 1932, and to 343,588,000 barrels in May, 1933. Although it rose back to 355,883,000 barrels in May, 1934, the crude storage again declined in the latter part of 1934, canceling the additions just made, and as of May 31, 1935, was down to 338,559,000 barrels.

Natural gasoline stocks, in contrast, have been increasing. From 4,029,000 barrels on hand May 31, 1931, the total rose to 4,270,000 barrels May 31, 1932, dropped back to 3,966,000 barrels in 1933, and has again increased, going to 4,420,000 barrels in 1934, and to 5,977,000 barrels as of May 31, 1935.

As in the case of crude stocks, the stocks of refined products have been steadily reduced. Although they rose from 253,866,000 barrels as of May 31, 1931, to 264,891,000 barrels a year later, they subsequently have declined consistently. On May 31, 1933, the refined oil stocks aggregated 250,648,000 barrels; in May, 1934, they totaled 227,410,000 barrels; and on May 31, 1935, the total was 223,804,000 barrels. From May, 1932, to May, 1935, the decline was 41,087,000 barrels, or nearly 16 percent.

Crude Output Back Near Peak

The domestic crude production trend has conformed closely with the trend of demand. From the all-time first five months' peak of 404,884,000 barrels in 1929, the crude production dropped off about 18 percent to a depression minimum of 332,797,000 barrels in 1932. In 1933, 1934 and 1935 there has been steady expansion of the production, this year's figure having been 393,847,000 barrels, or only 2.7 percent less than the 1929 peak.

There has not been as sharp recovery for production of natural gasoline and benzol as for production of crude oil. From the peak of 22,183,000 barrels for the first five months of 1930, natural gasoline production dropped to depression minimum of 13,640,000 barrels in 1933. It recovered to 14,671,000 barrels in 1934, and to 15,602,000 barrels in 1935. From its peak of 1,269,000 barrels in the first five months of 1929, benzol production sank to 465,000 barrels in 1933. It then rose to 745,000 barrels in 1934, but lost some of that gain by falling back to 731,000 barrels for the first five months of 1935.

As in the case of crude production, imports were curtailed during the depression. But even after demand turned upward, they continued to be held down rigidly. Crude oil imports have been steadily reduced since 1929, having fallen to a new low-mark this year. Refined oil imports have begun increasing, however, after going to a minimum last year.

Imports Low Lately

Total imports, including both crude and refined oils, have been held during the past three years at levels only about one half as high as formerly. From 45,908,000 barrels in the first five months of 1929, the total imports dropped to 42,923,000 barrels in the similar period of 1930, to 38,419,000 barrels in 1931, rose back to 43,046,000 barrels in 1932, then continued the decline with a sharp drop to 20,422,000 barrels in 1933, and a further fall to 19,872,000 barrels in 1934, the record low-mark, from which there has been a small gain to 21,712,000 barrels for the first five months of this year.

From 37,261,000 barrels in the first five months of 1929, the imports of crude oil have steadily dropped to one-third that amount. The five-months' imports declined as follows: to 25,363,000 barrels in 1930, to 21,531,000 barrels in 1931 to 24,375,000 barrels in 1932, to 14,119,000 barrels in 1933, to 14,098,000 barrels in 1934, and finally to 12,554,000 barrels in 1935.

Imports of refined products, by years, for the first five months, have been as follows: 6,196,000 barrels in 1928; 8,647,000 barrels in 1929; 17,560,000 barrels in 1930; 16,888,000 barrels in 1931; 18,671,000 barrels in 1932; 6,303,000 barrels in 1933; 5,774,000 barrels in 1934; and 9,158,000 barrels in 1935.

TEXAS HEARING

Statewide proration meet is to be held on July 18

Austin, Texas.—A statewide hearing has been called by the Texas Railroad Commission for July 18 at Austin. At this time evidence will be taken on which will be based August proration orders for both oil and gas.

Purchasers of crude oil and natural gas have been instructed to file with the commission prior to the hearing a list of their probable requirements for the month of August. These nominations, as they are termed, will be of unusual importance, since the Commission will issue before August 1 its first proration order on natural gas as provided in the new gas conservation law, H. B. 266.

Commission officials state that they have been advised that representatives from every gas field in the state will be present at the hearing.

Plug Back Opener

ARBUCKLE WELL AT BILLINGS TRYING TO SHUT OFF WATER

WEEKLY STAFF REPORT

Ponca City.—Mid-Co Oil Corporation and Rudco Oil and Gas Company's Yost 1-A SW NE NW NE 22-23n-2w, Arbuckle lime discovery well in the old Billings pool near here, has been plugged back from 4247 feet to 4215 feet and operators have decided that water is coming from behind the pipe rather than from the formation. This well several weeks ago created considerable excitement, when it started flowing at the rate of better than 400 barrels of oil per hour, the first Arbuckle lime production from beneath a structure which has yielded oil and gas from several horizons. After flowing 4500 barrels of oil it started cutting about 50 percent water. Standard tools were rigged up but while pulling tubing the well started flowing again, making 560 barrels of oil and 60 barrels of water. A bridge was encountered at 4214 feet and the hole cleaned out to bottom with a sand pump. It is understood that operators will attempt to recement the casing in an attempt to shut off water. Mid-Co and Rudco control 720 acres of leases around the well and have started Neil 1, SW SW SE 15-22n-3w.

These operators recently sold all production rights below 3000 feet under 480 acres lying on the west side of the area to Phillips Petroleum Company, which is drilling T. J. O'Neil 1, SE SE SE 16-22n-3w.

Montour Production Company et al's Ida Summers 1, SW SE NW 17-27n-2e, wildcat test in central Kav County, was dry and abandoned at 3707 feet after finding Layton sand at 2825 feet and Big lime at 3149 feet. The derrick is being skidded to Hollenbeck 1, SE NE SE 18-27n-2e.

SET CASING RECORD

Second Binger test runs longest pipe in Oklahoma

Binger, Okla.—Denver Producing & Refining Company set another Oklahoma record July 7, when it ran and cemented 7586 feet of 9⅝-inch O.D., 40.6-pound, Grade D, A.P.I. casing with long threads and collars in Sah-Cam 1, C SE SE 33-10n-10w, 1000 feet southwest of the now famous "Binger well" which is the deepest producing well in the world. The new test was spudded and 100 feet of 15½-inch surface pipe set during the first week in April. On the sixth day of that month drilling was resumed in 12¼-inch hole which was carried to the present total depth of 7626 feet. This depth was reached on July 6, an elapsed time of 90 days of which eight days were lost when drill pipe became stuck at 6450 feet.

258 Joints Used

Casing was started into the hole at 10:00 p.m. July 6 and the string was ready to be cemented at 12:45 p.m. the following day. The long string string went into the hole freely except for the last joint which had to be washed down due to material accumulated in the bottom of the hole. A total of 258 joints, averaging 29.4 feet per joint, made up the string which tallied approximately 7690 feet. Five and three eighths inches per joint were lost to screwage or a total of 115.5 feet and stretch was calculated to be approximately five feet.

A multi-stage cementing tool was set in the string at 5000 feet, a float collar at one joint above the bottom of the string and a second float collar two joints up from bottom with a regulation float shoe on the end of the string. Fifty-five minutes after the cementing pumps had been started 1000 sacks of cement had been put through the multi-stage tool and 1000 sacks around the shoe.

Records of deep tests show this new string of 9⅝-inch to be the second longest of this size ever run, the longest having been in Kettleman North Dome Association's 56-8Q, Kettleman Hills, Calfornia. This well was cased with 1200 feet of 20-inch, 6847 feet of 13⅜-inch, and 8304 feet of 9⅝-inch.

NICE COWETA WELL

Tulsa.—That the older producing areas of the state still are of importance from a discovery viewpoint was shown again during the week when Cahill, Howard and Howard completed for an estimated 100 barrels their F. Dobbins 1, SE NW NW 8-17n-16e, east of here in west central Wagoner County. The Pitkin sand which produces gas in the area to the north was missed, a rainbow showing of oil found in the Misener sand. Dutcher sand was logged from 990 to 1004 feet and the well flowed 15 barrels natural. It was shot with 20 quarts and swabbed 85 barrels in five hours, filling up 750 feet in three hours. Sinclair Prairie Pipe Line Company is laying connections to the well to take the 40-gravity oil. Correlation of the producing horizon as Dutcher sand is questionable.

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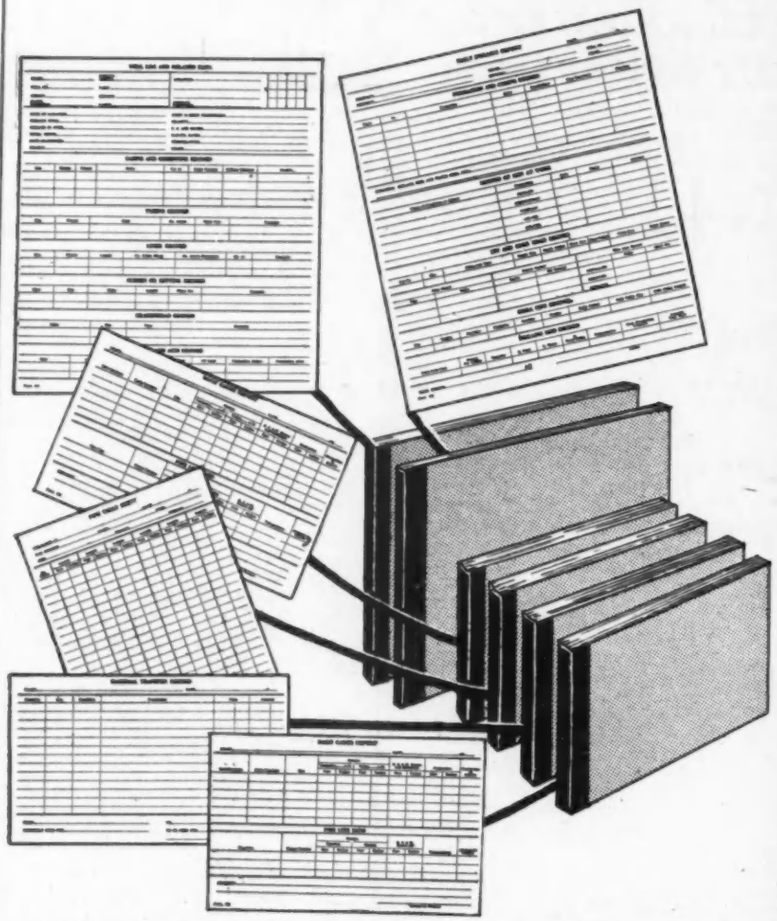

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The GULF PUBLISHING COMPANY

3301 BUFFALO DRIVE **HOUSTON, TEXAS**

OKLAHOMA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CANADIAN COUNTY—		
Larkin's Provine 1, nw ne 33-13n-5w	*	7748
CARTER COUNTY—		
Evans & Groves, Spears 1, ne nw sw sw 28-1s-2w	*	578
COMANCHE COUNTY—		
Ashcraft & Palmer, School Land 3, ne ne se se 20-2n-10w	¶3-88	883
COTTON COUNTY—		
Shasta Oil Co., Cobb 11, nw ne sw ne 2-2s-10w	27	2154
CREEK COUNTY—		
Tibbins Oil Co., Carter 6, ne ne se nw 18-14n-9e	55	2359
Acid Oil Co., 1-A Deere, se sw nw nw 7-17n-7e	¶4½	2828
L. B. Jackson, Morrow 1, nw nw se nw 1-17n-8e (pb 2675)	12	2814
M. & K. Drilling Co., Fields 1, nw sw nw se 13-17n-8e	*	2300
Rex Pet. Co., Leader 1, se se se sw 15-18n-8e	147	2686
Prairie Inv. Co., Johnson 1, se se se nw 7-18n-10e	5	2394
P. Adamson, Jr., 1-A Kerr, se se se sw 10-18n-10e	*	2615
GRADY COUNTY—		
T. H. McCosland, Slusher 1, nw nw nw se 28-3n-5w (pb 2470)	25	2672
HUGHES COUNTY—		
Stanolind-Amerada, 1 Rogers D, se se nw 8-6n-8e	61	2788
Orville Tilly, Amery 1, ne sw nw 28-7n-8e	*	1203
LE FLORE COUNTY—		
East Okla. O&G., Metcalf 1, sw sw sw 2-4n-26e	*	2040
LOGAN COUNTY—		
Stanolind et al, Nunn 1, se se nw 25-15n-1e	*	5477
Shell, McCully 6, ne sw se 30-19n-4w (otd 6173)	400	3930
McCully 10, ne nw se 30-19n-4w (otd 6010)	288	3960
MARSHALL COUNTY—		
Bland et al, Godwin 6, ne se se se 10-6s-6e	*	570
NOBLE COUNTY—		
Magnolia, Sharp 1, csw sw 34-20n-2w (pb 5039)	896	5186
OKFUSKEE COUNTY—		
Burke-Greis Oil Co., Jones 1, nw nw sw 20-10n-10e (pb 2953)	¶12	4025
OSAGE COUNTY—		
Norbla Oil Co.'s 2, sw ne sw sw 4-20n-10e	*	404
Bay Oil & Worley, Lessert 1, ne nw sw 25-22n-7e	146	2964
Rips O&S Co. 9, nw se se 26-23n-10e (otd 1747)	*	1775
Lewis Prod. Co. 3, ne ne sw 21-24n-7e	750	2668
5, ne se sw 21-24n-7e	*	2736
6, ne nw se 21-24n-7e	1054	2675
Continental & Gypsy, Mason 4, sw nw nw 22-24n-7e	231	2591
Carter et al, 8, nw sw nw 15-25n-6e	159	2856
Norbla Oil Co.'s 1, se nw se 29-26n-11e	10	1580
PAWNEE COUNTY—		
Marathon, 1 Gilbert No. 2, nw nw nw 19-22n-3e (pb 4475)	*	4847
PITTSBURG COUNTY—		
Dandridge et al, Mead 1, nw nw ne 17-5n-9e	*	1710
P. H. Gray et al, Lee 1, nw nw se 12-5n-13e	*	1210
PONTOTOC COUNTY—		
Phillips, Norris 11, ne nw sw 25-2n-6e	4360	4311
Carter, Brown 1, nw se se 25-2n-6e (otd 4300)	480	4220
Moore et al, Harper 2, se sw ne 29-2n-7e	¶4¾-10,832	4260
Schauers 3, ne sw nw 29-2n-7e	12,420	4274
Woodroof 2, nw ne se 29-2n-7e	13,080	4201
Radial, Simpson 1, nw ne ne 20-4n-8e	*	2070
SEMINOLE COUNTY—		
Stanolind-Amerada, Reed 2, se sw sw 25-6n-7e	812	4190
Magnolia, Reed 10, e½ ne sw se 30-7n-8e	2496	4210
Carter, Whitney 1, ce½ se sw 7-10n-6e	1040	4607
STEPHENS COUNTY—		
Morgan Pet. Callaway 1, se ne ne 17-1n-8w (pb 2190)	*	2579
TULSA COUNTY—		
Detmar, McIntosh 2, sw se ne 4-18n-14e	10	1408
WAGONER COUNTY—		
Sands Pet. Robin 7, ne ne sw sw 23-18n-15e	10	1065

*Failures; †Junked; ¶Million cu. ft. gas.

LEASING CLARK BLOCK

Area around Watchorn test again being leased

WEEKLY STAFF REPORT

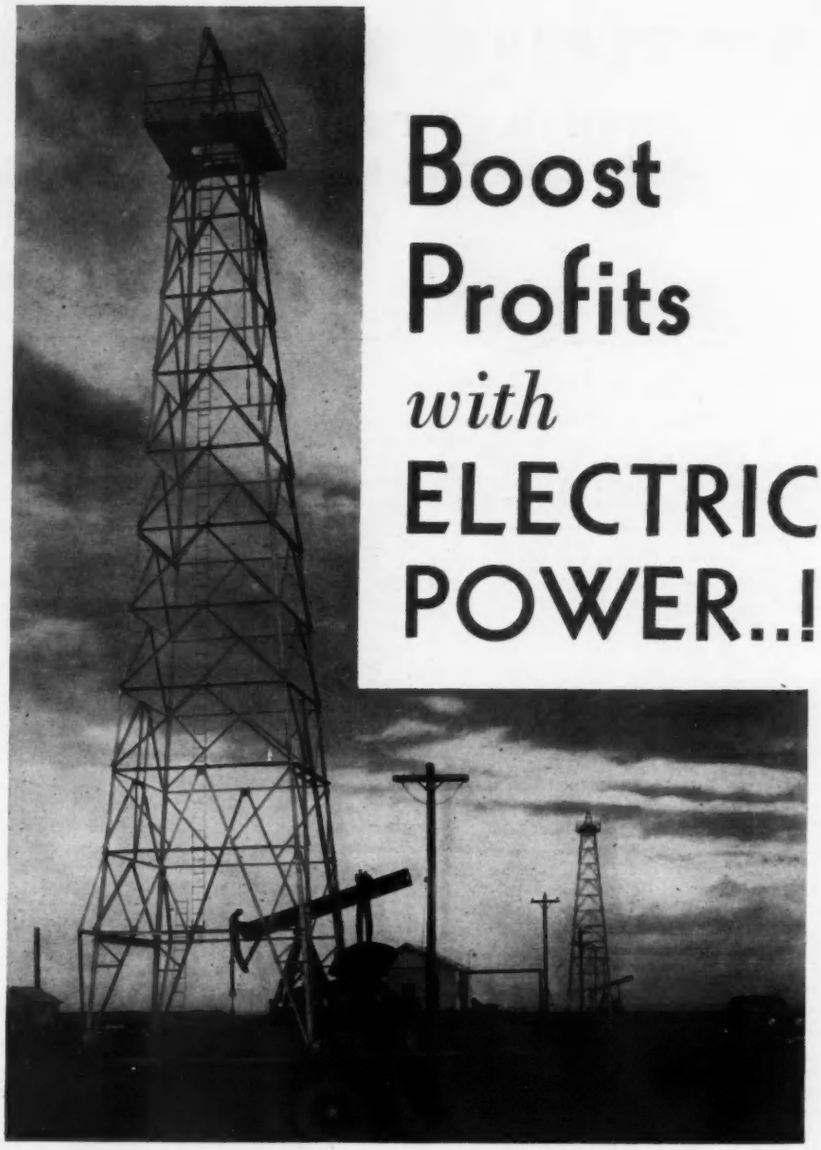
Ashland, Kansas. — Olson Drilling Company of Tulsa is reassembling the old Watchorn Oil and Gas Company block centering around Section 32s-21w, near the town of Sitka in eastern Clark County and plans on drilling a deep test in the area, location for which is unannounced. This area is of considerable interest and it was on the old block that Watchorn drilled Morrison 2, C NW NE 20-32s-21w, a dry hole at 6906 feet, the deepest test ever drilled in Kansas. Top of the Wilcox sand was encountered at 6698 feet and top of the Arbuckle lime at 6853 feet. It was abandoned on March 11, 1931.

KANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BUTLER COUNTY—		
Bennett & Abel, Lang 1, ne ne se 2-25s-3e (pb 2724)	*	2751
McKay et al, Haynes 1, se se sw 24-26s-4e (pb 2625)	150	2632
Pryor & Lockhart et al, Johnson 1, nw nw se 16-26s-6e	*	3218
CHASE COUNTY—		
Polhamus et al, Leedy 2, ne se nw 25-22s-9e	*	2420
CHAUTAUQUA COUNTY—		
Central Oil Corp., Crews 1, ne ne sw 8-32s-12e	*	1775
ELLSWORTH COUNTY—		
Western Pet. Explor., Wilkins 1, nw sw nw 9-17s-9w	*	3355
Vickers Pet. Co., Janssen 1, nw sw nw 13-17s-9w	2077	3214
Atlantic, Rolfs 3, nw ne se 14-17s-9w	1551	3191
GREENWOOD COUNTY—		
Houston Oil & Okla. Oil, Pegram 1, cnw nw 33-23s-13e	*	1776
LYON COUNTY—		
A. M. Landon, 1-A Haughton, se sw sw 29-21s-12e	*	1908
McPHERSON COUNTY—		
Mead Bros. et al, N. L. Chindberg 1, se nw se 19-18s-2w	¶2	2965
RENO COUNTY—		
McBride & Derby, Grandon 1, nw ne ne 3-24s-4w (pb 3368)	443	3817
Kilgore & Hansen, Myers 1, cse sw 10-24s-4w	lcn.	abd.
RICE COUNTY—		
Vickers Pet. et al, 1 Gouldner, se ne nw 16-18s-9w	800	3230
Anderson-Kerr et al, Lackey 1, ne se nw 13-21s-6w	*	3564
RUSH COUNTY—		
Morgan & Flynn et al, Gisich 1, nw nw se 25-18s-16w	*	3582
RUSSELL COUNTY—		
Palmer, Bender 1, se sw se 16-13s-14w	*	3343
Stanolind, J. E. Baxter 36, se se sw 32-13s-15w (pb 3060)	33	3132
Lario-Texas Co., Boxberger 2, sw nw nw 24-14s-15w	1092	3262
Sinclair Prairie, Hefferman 3, nw sw ne 26-15s-13w	120	3256
SEDGWICK COUNTY—		
Aylward & Shell, Stollei 2, nw se sw 11-26s-2e	563	2840
SUMNER COUNTY—		
Washoma Oil Co., Bussard 3, cel ne sw 36-31s-2e (pb 2500)	2	2775
Shawver, Neal 2, ne se se 29-31s-1w	225	3700
Stanley-Jarvis et al, Scroggin 1, sw sw ne ne 14-32s-2e	*	2094

*Failures; †Junked; ¶Million cu. ft. gas.



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Deep Gas Well

FOUND IN TRINITY HORIZON BY CAYUGA FIELD TEST

WEEKLY STAFF REPORT

Palestine, Texas.—The Trinity sand, potential source of production under fields producing from the Woodbine in East and Central East Texas, is showing high-pressure gas near the 8700-foot level in Tide Water Oil Company and Texas Seaboard Oil Company's N. N. Wills 21-A, situated near the center of their discovery leasehold in the Cayuga field, Anderson County. Except for a single gas well in eastern Cass County near the Louisiana boarder, involving an extension of the Rodessa field, the Trinity zone has not contributed commercial production in Texas, although it yields a limited volume of gas from the lastest of a quartet of deep tests at Mexia. The first try for production in the Trinity at Mexia showed for a big gasser with spray of oil, but was junked without a definite test.

Gas production in the Cayuga deep test has repeatedly threatened to clean the rotary drilled hole of its heavy fluid the past week while alternating with core barrel and rock bit. The hole is cased with 9⅝-inch pipe cemented at 4594 feet, near the top of the Georgetown lime section. The formation at the present depth is reported to be extremely hard, with progress slowed down to about five feet daily. The well has a surface elevation of 308 feet, and is now approximately 4100 feet below the first Georgetown lime.

Sponsors of the Cayuga field's first deep well are planning to make a production test of the first formation encountered carrying positive signs of oil saturation, as the disappointing results of the two promising producers from the Trinity at Mexia failed to take such precaution against passing up an oil horizon. Gas production from the Trinity zone would not be attractive at Cayuga for many years hence, as the entire structure, exceeded only by the giant East Texas field in area for Woodbine sand production, has a tremendous potential yield of high pressure gas overlying and within the oil sand.

Gas from the Woodbine is a hinderance as well as an aid, since nearly every producer must be brought in under small choke on tubing, usually ⅛-inch outlet, to avoid excessive gas-oil ratio. The average oil producer on the Cayuga structure, which now overlaps into three counties will convert itself into a gasser unless the flow is rigidly restrained. This accounts for the fact that the participating producers are fairly content with their proration quotas.

Development of a number of small leases by independents on the north end of the Cayuga field reveals very erratic sand conditions, with salt water showing above the average depth assigned the structure. Kirby Petroleum Company's C. L. Loper 1, center of 20 acres, Thos. Bristow Survey, tested 40 barrels of oil and 146 barrels of salt water from sand at 4088 feet, or 3760 feet sub sea, and will be plugged back. Fred Upchurch et al's C. L. Loper 1, center of 3½-acre lease, I. Clendennen Survey, has plugged back from 4096 feet, or 3765 feet sub sea, to 4091 feet because of water with gas. Stroube & Stroube's C. L. Loper 1, center of 11.31-acre lease, and a nearby location, showed lots of gas but no water on formation test at 4098 feet, or minus 3768 feet, although the sand core tasted salty. Casing will be set to complete at this depth. H. L. Hunt's Loper-Stanolind 1, first of the series of disappointments, has been completed as a big gasser after plugging back from salt water at 4106 feet, or minus 3774 feet, to 4085 feet.

Roeser & Pendleton, Inc.'s Ware & Wilson 2, situated 933 feet due west of the company's recent successful extension to the oil area, took in about five feet of oil sand in coring to 4080 feet, or 3771 feet below sea level, and showed for an oil producer on drill stem test. Seven-inch pipe will be set at about 4074 feet.

File Spacing Suits

[*Continued from page 28*]

4, the well under court attack, is situated 150 feet out of the southwest corner of the lease, and is not an offset to the complainant. Magnolia Petroleum Company owns the lease bordering on the south, while Brothers Oil Company owns a 10-acre lease adjoining to the west. Humble Oil & Refining Company owns two 15-acre leases lying immediately west of the Brothers Oil Company's property, and three wells are on each, with the last well drilled spotted 202 feet west of Brothers Oil Company's nearest producer. Magnolia Petroleum Company was authorized to observe a spacing of 202 feet apart in offsetting the south well on the Brothers Oil Company's lease and the offset drilled by Humble Oil & Refining Company.

Humble Oil & Refining Company also has filed suit against the commission to set aside permit that authorized the Southport Petroleum Company to drill Kilgore Independent School District 3, situated on 8.35-acre lease, Mary Van Winkle Survey, Gregg County.

Oil at Long Lake

Recovery of oil saturated sand from the Woodbine section in Tide Water Oil Company and Texas Seaboard Oil Company's Shaw & Cern 1, situated about three-quarters of a mile northeast of completed gasser in the Long Lake field, southwestern Anderson County, promises to re-establish the area as an important source of oil production. This outpost logged top of Woodbine section at 5140 feet, or 4840 feet sub sea, and after encountering usual gas zone cored oil stained sand at 5339 feet. Oil saturated sand topped at 5355 feet improved in porosity in coring to 5377 feet, where operations were halted to run casing to complete. The field has two oil producers on the Monnig discovery leasehold, and five completed gas wells that produce considerable distillate.

DECLINE IN DRILLING

Non-flowing completions prominent during week

Tyler.—Reflecting the sharp slump in drilling activity experienced by the East Texas field since the early part of July, completions declined to 97 the past week as compared to 117 the previous week. Two junked holes and one failure were included among the completions listed for the past week, leaving 94 producers. Independent operators accounted for 52 of the current quota of completions, or slightly more than half of the total.

Non-flowing wells figured prominently in the list of completions recorded the past week, as 18 wells, or slightly more than 19 percent of the total new oil wells, established initial gauges by pumping or swabbing. While it is true that the majority of these dormant producers are situated on the edges of the structure, a few are along the west flank where bottom-hole pressures are the highest.

Sinclair Prairie Oil Company added two pumpers, including Joe E. Lawther 18, located on the east side in southern Gregg County. This company's W. B. Walker 7, situated on the west side of the field in Gregg County, is reported to have swabbed 21 barrels hourly from sand at 3671-75 feet, with the hole bottomed at 3311 feet sub-sea.

W. G. Turbeville et al's Cora L. Graham-Marathon 1, NEc of 160-acre lease, Peter Tipps Survey, near south portion of Joiner area, Rusk County, made initial flow of 10 barrels hourly from sand at 3644-45 feet, or 3318 feet sub-sea. The well failed to maintain its natural flow, and will be rigged to pump. Marathon Oil Company farmed out this lease and required the drilling of four wells to appease royalty owners. Prince Brothers Drilling Company and J. H. Massie's L. C. Herring 1, situated on 15¾-acre lease, R. W. Smith Survey, Rusk County,

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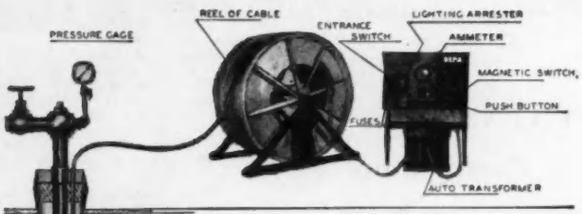

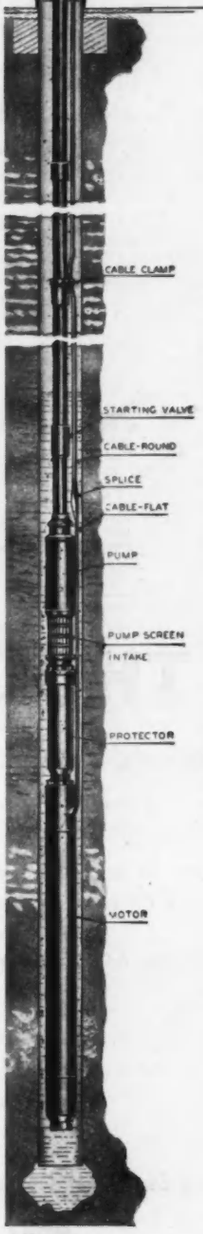

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missed the sand and was abandoned in Georgetown lime at 3642-3660 feet, although it is a north offset to a small pumper developed last March by Joe Sanders et al's C. C. Cooper 1, which extended the Joiner area about 4000 feet to the east.

EAST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Arcadia Ref. Co., Green 12-A (55.56-ac)	4600	3784
Atlantic, Thompson 10 (50-ac)	9800	3718
C. Young 9-C (63-ac)	9000	3689
Colony Oil Co., Wright 3 (10.02-ac)	6000	3692
Wright 5 (10.02-ac)	6800	3694
Estes et al, Cole 1 (6-ac)	7000	3767
R. W. Fair, Inc., fee 10 (30-ac)	7500	3642
W. H. Gant-Garvin & Wegener, J. W. Harris 7 (397½-ac)	600	3626
W. P. Moore 19 (134.24-ac)	500	3585
Gulf, G. G. Turner 35 (312.03-ac)	5000	3709
Humble, J. H. Arnold 11 (81-ac)	4000	3810
M. & R. Kangerga 51-A (333¼-ac)	9200	3691
J. H. Silvey 17-A (142.85-ac)	9500	3716
J. E. Wheelis 19 (168.4-ac)	7000	3743
Hunt Prod. Co., R. W. Fair 22-A (136.72-ac)	11,000	3657
Illinois Oil Co., Mayfield-Shell 15 (197.1-ac)	6000	3817
Mayfield-Shell 17 (197.1-ac)	6000	3812
Jenkins Bros., Bradford 2 (5-ac)	240	3594
Johnston & Rogers, Mullins 6 (30-ac)	9700	3794
Magnolia, A. T. Tyiska 6 (116.94-ac)	5500	3808
Marathon, S. H. Moores 24 (193.8-ac)	7200	3690
Overtex O&G Co., Rettig 3-A (100-ac)	1500	3662
Prince Bros. Drl. Co., L. C. Herring 1 (15¾-ac)	*	3660
Geo. B. Ray Corp., Pinkston 10 (49-ac)	8000	3622
Retsal Drl. Co., Maxwell 8 (34.93-ac)	600	3610
Salmon & Carter, Frederick 2-B (7-ac)	240	3572
Shell, Brooks 18-B (176.4-ac)	3500	3719
Sinclair Prairie, Mayfield 51-A (374.74-ac)	5800	3785
F. B. Wilson 20 (124-ac)	10,500	3645
F. B. Wilson 21 (124-ac)	7000	3668
Slaughter & Metcalf, Frederick 1 (2-ac)	300	3567
Sun, Hendon 17 (119.41-ac)	145	3579
Texas Co., A. S. Jarvis 15-A (161½-ac)	7600	3624
Texas Canadian Oil Corp., Irion 3-C (27-ac)	6000	3764
Irion 5-C (27-ac)	5800	3740
Texas Jersey Oil Corp., Wooley 2 (5-ac)	360	3609
Trippmead Oil Corp., Thompson 7 (6.06-ac)	7500	3806
Turbeville & Smith, Graham 1, Lse. 1 (160-ac)	250	3645
Turman Oil Co., Dark 9 (48¾-ac)	7000	3760
Tysco Oil Co., Frederick 1-D (3-ac)	240	3565
Weaver-Crim Corp., Stone 8 (49.26-ac)	5500	3749
Westgate Oil Co.-Salem Oil Co., M. Cross 1 (63.43-ac)	100	3700
KILGORE AREA—		
Allen et al, Dickerson 1 (21.1-ac)	3500	3738
Amerada, Lacy 10 (83.6-ac)	4600	3578
Lacy 11 (83.6-ac)	5000	3585
Atlantic, S. G. Andrews 5-B (30-ac)	10,000	3625
Atlantic & Byrd-Frost, Smith 11 (40-ac)	10,500	3569
Beard et al, Elder 2 (27.16-ac)	100	3552
DeArman & McMillan, Wells-Shell 1 (60.13-ac)	50	3751
Wells-Shell 3 (60.13-ac)	500	3750
Dyck Oil Co., Blackman 6 (50-ac)	7600	3672
Empire, Christian 12 (103.05-ac)	7300	3732
Gulf, Davis 11 (50-ac)	7200	3578
W. Florence 19 (165.09-ac)	7000	3664
S. B. Hall 8 (50-ac)	8200	3681
J. S. King 5 (29.57-ac)	8000	3586
Will Oten 6 (48½-ac)	4000	3691
Erle P. Halliburton, Inc., Lacy-Shell 9-B (63.3-ac)	9600	3638
Humble, L. D. Crim 159 (914.51ac)	7500	3656
Kimbell & Baldwin, Carr 2 (2-ac)	500	3539
Magnolia, Radford 31 (252-ac)	9000	3705
Pewitt et al, Mayfield 1 (10-ac)	240	3646
Mayfield 2 (10-ac)	240	3622
Sinclair Prairie, Kennedy 2-C (32.8-ac)	500	3665
J. E. Lawther 18 (317.68-ac)	100	3578
W. B. Walker 6 (80-ac)	7000	3692
W. B. Walker 7 (80-ac)	500	3675
Sowell et al, Luse-Walker 7 (33.96-ac)	4500	3580
Stanolind, Powers 9 (90.91-ac)	6000	3730
Stroube & Stroube, Beall 6 (28-ac)	600	3580
Sun, Beall 21 (180-ac)	5000	3605
Tide Water, Bean 11-B (50-ac)	10,000	3622
H. P. Leverett 16 (109.44-ac)	9000	3665
Trippett et al, Nichols-State 3 (5-ac)	5000	3678
West et al, King 1 (1.1-ac)	†	3670
LONGVIEW AREA—		
Amerada, Killingsworth 11 (100-ac)	7200	3608
Arkansas F. O. Co.-Yount-Lee, Lathrop 15-A (83.2-ac)	8500	3579
Atlantic, W. P. Duncan 20 (154.7-ac)	10,600	3658
J. M. Moore 73 (447¼-ac)	11,000	3530
J. M. Moore 75 (447¼-ac)	10,400	3531
Barnett et al, Buckholt 2 (63.7-ac)	1200	3697
C. & G. Oil Co.-Alger Oil Co., Harris 17 (91.54-ac)	9800	3508
Collins-Gray & Wolfe, C. Fisher 8 (134.69-ac)	3000	3435
Fields et al, Mose 2 (5-ac)	8500	3597
Grant Plains-Hughes, Christian 5 (24-ac)	7500	3620
Humble, G. W. Johnson 17 (98.9-ac)	4500	3714
A. O. Phillips 9 (82¾-ac)	5500	3731
Magnolia, Christian 14-C (64.95-ac)	8000	3665
G. W. Richey 11 (45-ac)	9000	3642
Ray & Miller, Jones 5 (21-ac)	7600	3596
Shell, Stinchcomb 13 (89.76-ac)	7800	3512
Stanolind, Shoults 4 (21.42-ac)	6000	3694
Sun, Ramey 12 (86.54-ac)	300	3793
Sutton & Hawkins, Whitaker 13 (35-ac)	9200	3530
Tide Water, Nettleton 14-A (148¾-ac)	5500	3533
Travis & Wair Oil Co., Owens 2 (20-ac)	†	650
Woodley Pet. Co., Harris 5 (30½-ac)	9000	3536
ANDERSON COUNTY (Cayuga Field)—		
H. L. Hunt, Inc., C. L. Loper Stanolind 1 (47.76-ac)	¶50	4106
Tide Water & Texas Seaboard, G. W. Ware 10 (571.65-ac)	3500	4097
N. N. Wills 25-A (832.29-ac)	3000	4085
Joe A. Worsham et al, W. F. Wathen 2 (80-ac)	2500	4050
HUNT COUNTY—		
H. G. Samson, Shawver et al, J. R. Phillips 1	*	3261
FRANKLIN COUNTY—		
John E. Farrell & Co., G. K. Ayres 1 (50-ac)	*	4400
SMITH COUNTY—		
R. W. Fair et al, Fred Terrell 1	*	5230
VAN ZANDT COUNTY—		
Newt Tidwell & W. J. Rogers, L. E. Breucher 1-A	*	4509

*Failures; †Junked; ¶Million cu. ft. gas.

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TEXAS PANHANDLE

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARSON COUNTY—		
Stanolind, F. E. Percival 3	182	3283
DALLAM COUNTY—		
Warner et al, Jarboe 1	*	3965
GRAY COUNTY—		
Bradshaw O&G Co., E. L. Sackett 2	362	3306
Gulf, R. B. Thompson 9	200	3270
King Roy. Co., R. B. Thompson 4	357	3260
Cy Rieger et al, A. Chapman 1	*	2850
Stanolind, Amanda Waggoner 3	693	3294
Texas Co., M. B. Davis 9	750	2801
J. E. Williams 16	588	2770
HUTCHINSON COUNTY—		
Gulf and Panhandle Ref. Co., C. L. Dial 51	150	3055
WHEELER COUNTY—		
Remo Royalty Co., Sewall 1-A	*	2261

*Failures; †Junked; ¶Million cu. ft. gas.

Wildcat Producer

FIRST OF SEVEN WILDCATS AT WALTON-KEYSTONE FLOWS

WEEKLY STAFF REPORT

San Angelo, Texas.—Production test given the first of the seven wildcat projects launched upon the Walton-Keystone structure, north central Winkler County, proved the 3500-foot dolomite lime zone for flowing production, although the volume of oil was not in proportion to the gas yield. This important new addition to West Texas crude reserves was made by Gulf Production Company's Keystone Cattle Company et al 1, which was flowing about four barrels of oil and 1½ barrels of drilling fluid hourly through 2½-inch tubing on July 12, with gas volume at approximately 7,000,000 feet daily, indicating a 100-barrel oil well. The oil tests about 35 gravity, corrected, or almost identical with the gravity of oil produced in the Hobbs field, New Mexico, situated along the same geological trend to the northwest.

The Walton-Keystone structure offers more structural relief than any of the one-half dozen oil producing areas in Winkler County, and bears a striking resemblance to the Hobbs area, when key formations are correlated, although the former is somewhat shallower. Gulf Production Company proposes to allow its producer to flow for several days, then may treat with acid or deepen.

The discovery well of the Walton-Keystone area was slow in cleaning itself of drilling fluid. It was washed in shortly after noon July 10 through 2½-inch tubing, and casing pressure built up to 375 pounds in 10 minutes. Production was averaging 20 barrels hourly, estimated 65 percent oil, on the following morning with gas flow rated at about 11,000,000 feet daily. A pipe line outlet will be available in short order, as this well affords ample gas to provide Gulf Production Company's eight other tests on the structure with boiler fuel, making it possible to convert a temporary four-inch gas line built from the Hendrick field.

Gulf Production Company's Keystone 1 is situated in the NEc NW¼ section 10, Block B-3, P. S. L. Survey, and ranks second in high structural position of the seven active tests under way in the immediate area at the time of the dolomite lime became proved for production. Top of lime was called at 2090 feet, or 852 feet above sea level, and first oil saturation was found at 3198 feet. The hole was drilled to a sub sea depth of 558 feet, with seven-inch casing cemented at 3175 feet.

Sid Richardson et al's J. B. Walton 1, NWc SW SW Section 1, situated a short distance to the north of the discovery well and the furthest north test, will be the next completion, having cemented 5 3/16-inch casing at 3250 feet after showing for an oil producer on drill stem test at 3465-3524 feet, or 577 feet sub sea. Richardson launched the initial test for the structure last December, and in picking up first lime marker at 2115 feet, or 832 feet above sea level, followed by gas production, substantiated geophysical data. Gulf Production Company staked its nine locations, spotted on separate sections, in May, and immediately started work on six of the projects so as to comply with lease contract, due to expire August 22, 1935.

Gulf Production Company's Keystone 2, SWc Section 17, located three miles southeast of the discovery well, shut down at 3705 feet, or 764 feet sub sea, to run 7-inch pipe at 3100 feet, after failing to show oil or gas on formation test at 3672-3705 feet. Some water appeared in the tool. The company will try to make a well, although it is about 200 feet low on structure. Casing has also been set near the 2600-foot level in Keystone 4, with the hole bottomed at 3100 feet, to try for oil or gas in the sandy lime section. The latter is on the south end of the structure, and is probably too low to produce from the dolomite lime. Such is also true of Keystone 6, which is reaming hole at 3319 feet. Keystone 3 has been delayed with parted casing near the surface, with the hole bottomed at 3319 feet, and Keystone 5, occupying the highest structural position with brown lime checking 10 feet above the oil producer, has cemented 7-inch casing at 3150 feet. Operations on Keystone 7, 8 and 9 are slated to get under way by the end of the week.

Dobbs Oil Company's Friend 1, southern Reagan County wildcat, gauged 320 barrels of oil during first 24-hour pumping test after shot in lime at 2330-95 feet. The hole was plugged back from sulphur water at 2465 feet to 2440 feet. W. J. Dobbs, president of the company, announced that the well will not be tested again until pipe line connections are completed.

WEST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANDREWS COUNTY—		
E. M. Wahlenmaier Pet. Corp., Bitler & Getty (Odessa Ranch) 1...	*	4807
ECTOR COUNTY—		
Stanolind, J. M. Cowden 18	780	4215
GLASSCOCK COUNTY—		
Conoco & Group 1 Oil Corp., W. R. Settles 16	599	2190
HOWARD COUNTY—		
Herschbach Pet. Corp., J. P. Davis 2-A	116	2807
JONES COUNTY—		
Ungren & Frazier, H. Dorsey 1-A..	822	1985
PECOS COUNTY—		
Amerada Pet. Corp., University 3-A	465	1655
UPTON COUNTY—		
Int'l Pet. Corp., H. L. McClintic 2-A	385	3030
WARD COUNTY—		
California Co., B. D. Durgin 32....	973	2547
Gulf, Hutchings Stock Assn. 42....	516	2793
WINKLER COUNTY (Sayre Field)—		
Mid-Continent Pet. Corp., J. F. Howe 1-B	441	2960
REAGAN COUNTY—		
Hobbs Oil Co., Friend 1	320	2465

*Failures; †Junked; ¶Million cu. ft. gas.

PROLIFIC RECOVERY

Is found in Gulf-Waddell Field in Crane County

San Angelo.—The Gulf-Waddell field, north Central Crane County, is in line to receive its long deferred drilling program through the uncovering of prolific oil production in a northwest trend from the original group of wells drilled by Gulf Production Company near the center of its approximately 38,000-acre block. This company's M. F. Henderson 1, C SE Section 3, Block B-23, PSL Survey, extended production about three quarters of a mile to the northwest, flowing 805 barrels of 33.5 gravity oil in 10½ hours through casing from saturated lime at 3520-3523 feet. The oil flow attained a rate of 117 barrels per hour, and the gas volume was estimated at 2,551,000 feet daily.

Production in the Gulf-Waddell area was uncovered in August, 1927. The first seven tests drilled at scattered points over the south portion of the large leasehold, included two failures, and the remainder were not attractive producers. The company resumed payment of rentals to preserve its 10-year lease contract rather than to operate these small wells and continue exploration work. Wahlenmaier Petroleum Corporation et al revived interest in the area last year in developing a small producer to the northeast of the discovery block. Gulf Production Company resumed exploration work, and in drilling Waddell 9, C NE Section 11, Block B-23, developed a flow of 241 barrels of oil in eight and one half hours from lower lime section at 3540-43 feet, or 775 feet sub sea. This well topped the lime at 3090 feet, or 322 feet below sea level, while the most recent and largest producer likewise took in three feet of pay in drilling to a sub sea depth of 745 feet, having logged top of lime 38 feet higher on structure. Magnolia Petroleum Company's W. P. Edwards 1, a north offset to Waddell 9, was drilling near the 3400-foot level late last week.

An early test of the Seminole structure, Gaines County, where cash bonuses of $100 per acre have been paid by Humble Oil & Refining Company within and near the town on the strength of favorable geophysical data, promises to materialize through the efforts of W. T. Walsh and associates. These independents are negotiating for a well to be drilled in NE¼ Section 228, Block "G," W. T. Ry. Survey, about three miles northwest of Seminole, with about six major and large

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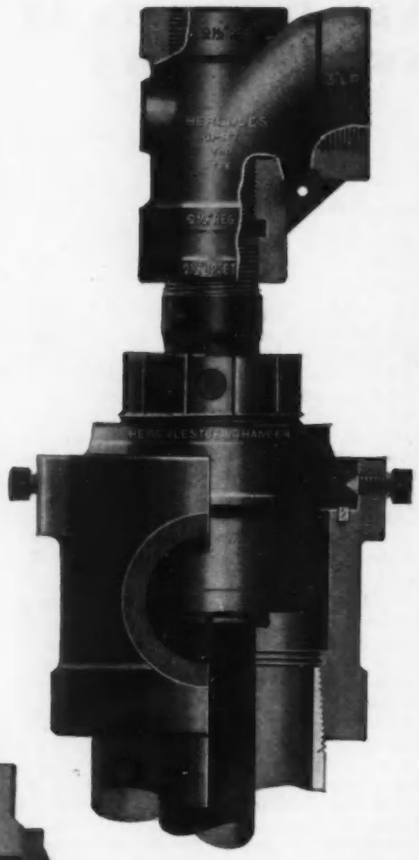

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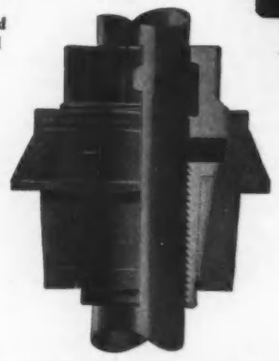

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Ector County

Ector County developed an interesting geological prospect the past week when Sun Oil Company and Atlantic Oil Producing Company's O. B. Holt 1, SWc Section 5, Block 43, T & P Ry. Survey, T-1-N, situated two and one half miles northwest of the North Cowden field, registered a high structural position in drilling to 3940 feet. Show of gas was logged in Yates sand at 2845-50 feet. First lime section was called at 3650 feet, and top of second lime at 3901 feet, with an elevation of 3108 feet. Sun Oil Company is also to seek production to the south of the same field, having made location for L. E. Wight 1-B. NEc S½ Section 10, Block 43, T-1-S. A. R. Eppenauer Drilling Company's Wight-Conoco 1, NWc NE¼ Section 21, about one and one half miles to the south, is changing from rotary to machine after drilling to 1766 feet.

NORTH TEXAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ARCHER COUNTY—		
Burns et al, Albers 5, blk 117	100	1254
M. Kob 3, blk 116	100	1252
Consolidated-Pet. Prod. Co., Portwood 11-D, sec 1587	1000	1374
Portwood 12-D, sec 1587	275	1390
Continental, Falls County 11-C	25	1124
Cullum & Alexander, Falls 35, blk 23	22	1127
Falls 36, blk 23	20	1137
Falls 38, blk 23	*	1172
Florey Oil Co., F. Brazina 5, sec 2410	110	1440
Deep Oil Co.-Lindsey Drlg. Co., McCrory 2, lse 4-A	750	2219
Grace & Woods J. H. Turbeville 1-A	25	2847
Gray Drlg. Co., Mankins 1, sec 2	*	690
Huggins Oil Co., W. Ford 4	10	1003
Panhandle Ref. Co., H. Prideaux 7-F	*	722
Perkins-Cullum Oil Co., Falls 183, blk 21	*	2500
Falls 184, blk 5	125	1184
Falls 185, blk 5	100	1180
J. O. Rogers et al, J. Kreeger 1, sec 2434	*	1456
H. Sackett et al, G. P. Meade 1	*	1314
Steele & Scott, J. R. Garvey 2	95	786
Teague & Maddox, J. D. Carpenter 1, sec 38	*	915
Underwood & Campbell, Campbell 10-B, sec 1377	*	1065
War-Tex Prod. Co., E. Hausler 1	*	1210
CLAY COUNTY—		
R. J. Brown et al, Sid Webb 1	*	1158
COOKE COUNTY—		
John Merrick, Inc., J. W. Hess 1	190	864
G. A. Stelzer 3	10	820
United Prod. Co., J. H. Cooke 1	*	1654
JACK COUNTY—		
Worth Oil Co., J. W. Maxey 10	*	468
MONTAGUE COUNTY—		
Conoco, J. W. Lawler 9	112	1742
Raisen Bros. Hinton 6	3	793
Seitz Bros. et al, C. A. Walling 1	*	2509
WICHITA COUNTY—		
Burk Royalty Co., Allen-Kemp 9, blk 44	*	846
R. R. Clark et al, Bickley 39, sec 2	50	1971
Humble, Williams-Parker 1, blk 25	*	2070
WILBARGER COUNTY—		
Waggoner & Kolp, Waggoner Est. 4, sec 18	¶½	795
YOUNG COUNTY—		
Akin & Hawkins, Deitrich 2	*	1150
Burns et al, W. J. Logan 1, sec 69	*	1262
Goldsmith et al, J. R. Wilson 3, sec 162	45	994
Hawkins et al, Kirkland 3, sec 2249	*	775
Nash-Windfohr Oil Corp., Rubenkoenig 2	*	3385
W. R. Stafford et al, Hawkins 1, sec 1917	*	550

*Failures; †Junked; ¶Million cu. ft. gas.

Extend Plymouth

TEST 1½ MILES SOUTHWEST IS GOOD ON DRILL STEM

WEEKLY STAFF REPORT

San Antonio.—Magnolia Petroleum Company's Corpus Christi Bank and Trust Company 1, located 9000 feet southwest of the Plymouth field in San Patricio County, is in process of completion at 5600 feet. It makes the field more than three miles long, north to south, and indicates that the proven area will run into at least several thousand acres, possibly much larger.

The Magnolia Petroleum Company test is located 710 feet from the north line and 330 feet from the east line of the H. H. Hunter Survey and is just south of Chiltipin Creek.

On a six-minute drill stem test of five feet of sand between 5595-5600 feet, it showed 330 feet of pipe line oil and 330 pounds pressure, and was free of water. Casing has been set and cemented.

The well is a direct west offset to acreage held by Sun Oil Company and is slightly more than a location south of unleased acreage held by Eliza H. Welder. Stanolind Oil and Gas Company, Humble Oil & Refining Company and Magnolia Petroleum Company hold the majority of the acreage in the general vicinity. The acreage between this extension well and the field is held by Violet Oil Company. Heep Oil Corporation and Plymouth Oil Company, all of which are now carrying on drilling operations.

There are ten active rigs in the field, being divided as follows: five by Plymouth Oil Company, one by Magnolia Petroleum Company, one by Benson et al, one by Violet Oil Company and two by Heep Oil Corporation. It is the Plymouth Oil Company's plan to run five to six in the field until the desired production is obtained, which it is understood is well in excess of 5000 barrels per day.

Republic Pipe Line Company, an associate company of the Plymouth group, is commencing a pipe line outlet to Corpus Christi for this district, and likely will act as a common carrier for all producers in the new area.

Plymouth Oil Company's Welder 4-C, Section 48, is cleaning at 5639 feet, showing for an excellent producer. Welder 6-C, same section, is drilling around 5300 feet. Welder 5-C, Section 45, showed 600 feet of pipe line oil in 12 minutes from the 5600-foot sand and is in process of completion. Welder 7-C in the same section, is down 3500 feet. Welder 8-C, Section 49, is rigging up.

Heep Oil Corporation tested salt water and oil, about 50 percent each when completion was attempted at 5667 feet in Welder 2-E, and it has been plugged back for another completion attempt. Welder 3-E is coring for the sand. Both wells are in Section 46. Violet Oil Company's Welder 1, Section 47, is nearing 5000 feet, while Benson and Jones' Welder 1, Section 38, has been started.

Plymouth Oil Company's Welder 1-D, Portillo Survey, Section 1, southeast side of the Sinton field, is in process of completion. It drilled to 6680 feet, plugged back to 5925 feet and set casing to total depth. Casing is being perforated in upper sands.

Just north of the Angelita field, Continental Oil Company and Atkins & O'Neil's J. F. Welder 3 is drilling at 5428 feet in sidetracked hole. It drilled to 5561 feet, showing oil and salt water in sand at 5547-61 feet. The well plugged back, whipstocked out at 5397 feet and is to re-drill the sand.

VARIED RESULTS

Obtained in Government Wells trend play

San Antonio.—Varied results in Government Wells trend wildcats and field outpost wells offer some unusual problems in these Duval-McMullen Counties areas. While several fields were given excellent extensions, direct offsets to excellent producers fail to make producers in the same horizons.

Humble Oil & Refining Company's Temple D. Smith (Fredericksburg State Bank) 1, Section 382, more than one half mile west of the Seven Sisters field, Duval County, made a drill stem test from 2480-91 feet, showing 1800 feet of pipe line oil in 18 minutes and has set casing preparatory to completion. It cored sand at 2483-93 feet. This sand is considered to be deeper in the section than any production thus far found in the field. It has an elevation of 494 feet, derrick floor, making it lower than the two oil producers of Santa Clara Oil Company, only Government Wells sands producers in the field.

Santa Clara Oil Company's Wood-Welder 2, Section 385, extreme southeast side of this field, flowed 16 barrels per hour through ¼-inch choke from 2452-68 feet. It is showing a tubing pressure of 750 pounds and casing pressure of 960 pounds.

Dulce Oil Company's R. Serna 1, Section 384, southwest offset to the above field's discovery well (Hockleyensis sand) has been abandoned after failing to show anything at the discovery level and making salt water in the Government Wells section. It went to 2675 feet.

Loma Alto Field

Several miles to the north in the Loma Alto field of McMullen County, more offset tests have failed to make producers.

Darby Petroleum Corporation's Hagist 1-C, Section 108, southwest offset to the discovery well, tested 14 thribbles of salt water in the Mirando sand at 2624-28 feet. It previously has shown salt water in the Government Wells sands after having only a slight show at 2190-92 feet in the Hockleyensis, the discovery sand.

Texio Oil Company & Illinois Petroleum Company's Atkinson 2, direct east offset to the discovery well, had sand at 2173-77 feet, another broken section from 2222-49 feet, tests being made from 2161-2249 feet. These developed mud with only a streak or two of oil and show of gas. It is being carried deeper.

Humble Oil & Refining Company's Atkinson 1, due west offset to the discovery, is to resume drilling at 2003 feet as soon as water is supplied. This well is to be cored the rest of the way down so as not to miss any sands.

Bridwell Oil Company's H. D. Sutherland 1-A, Section 122, two locations west of the same company's Sutherland 1, is jetting 100 barrels of fluid per day, 12 percent salt water from 2697-2713 feet. The first well showed considerable oil in this sand, Government Wells, but went to salt water. Further drilling is expected to develop a field in the area. Slightly more than a mile northwest of this well, Stewart & Parr's Bishop Cattle Company 1, Section 74, failed to show anything promising in the series of sands and has been abandoned at 3009 feet.

Loma Novio field offered several new completions during the week with more wells drilling. Rodney Delange's Hahl 1, Section 78, is completing at 2651-65 feet, Frank Gravis' Byland 2, Section 78, is completing about the same level. Highland Oil Company's Hubbard 1, Section 72, is on sand at 2663-82 feet and ready to drill plugs. Humble Oil & Refining Company's Hubbard 2, Section 84, is flowing 16½ barrels an hour through valves from 2794-2810 feet; Ruiz Estate 6, Section 553, is drilling plugs at 2768 feet; Wood-Welder 1-D, Section 72, is pumping 10 barrels per hour, 48-inch stroke, at 2731 feet. Magnolia Petroleum Company's Hahl 3, Section 67, is swabbing 2620-30 feet, with 2000 feet of oil in the hole. Shell Petroleum Corporation's Hubbard 1, Section 77, is completing just above 2800 feet. Stieren Oil Company's Wright et al 3, Section 72, is completing at 2714 feet. The Texas Company's Ruiz 1, Section 41. is drilling plugs at 2538 feet. Texla Oil Company and Rosan's Hubbard 2, is rigging up to pump at 2794 feet. There are a number of other tests being drilled in the field at various levels.

Refugio, Texas.—United Corporation has completed its new warehouse and office building, located near the Missouri Pacific depot in Refugio. It is a concrete and steel construction, costing approximately $12,000.

IMPORTANT TEST DRY

West Tuleta apparently is two separate pools

San Antonio.—Failure of a key well in the West Tuleta area of Bee County, has thrown a new geological light on this field, indicating that it is composed of two separate pools, rather than a solid producing area.

Simms Oil Company (Tide Water) J. K. Renno 1, north end of an 80-acre tract out of the southeast corner of Section 21, J. M. Uranga Grant, cored salt water sand at 4010-13 feet and has been abandoned. It has an elevation of 347 feet, showing the test to be 42 feet below the water line. This well is midway between the original West Tuleta field and the southwest extension area, commonly referred to as "New Ray." The southwest extension area has been prorated on the basis of another pool.

Several more excellent producers have been provided in the district, including the two Tuleta areas and the Dirks pool. Dirks Bros.' R. C. Harris 4 flowed 35 barrels an hour initial from sand at 3876-95 feet. After pinching down on ⅛-inch choke, it built up a casing pressure of 1150 pounds and tubing pressure of 750 pounds. Stanolind Oil & Gas Company's W. G. Walton 2, is good for seven and one half barrels per hour through 3/16-inch choke from 3933-39 feet.

SECOND WELL

In new Webb County field flowing 17 barrels hour

San Antonio.—Mills Bennett's J. Lopez 2, second well to be drilled in a new Webb County field discovered by this operator, is a completion flowing 17 barrels per hour through ½-inch choke. It has sand at 2168-74 feet, casing set atop the producing horizon.

This new producer is located 330 feet from the south and east lines of the discovery tract (110 acres), being the west half of tract 10-B, Section 73, 10 miles north of Bruni. It is slightly more than a location southeast of the discovery well, which is a 75-barrel oil producer, making a large volume of gas.

The third well is being started one location due north of the newest producer.

PORT LAVACA SLIPS

One producer and failure in week; work reduced

San Antonio.—One producer and one failure made up the completion list in the Port Lavaca field of Calhoun County during the week. Still another failure was registered in the wildcat territory west of the field. Active rigs in the district were cut to three, indicating a material let down in the boom-like fever in which the field's development commenced.

Halliburton Oil Production Corporation's D. Burton 2, M. Sanchez Survey, gauged 176 barrrels per day through 16/64-inch choke, showing a tubing pressure of 775 pounds and casing pressure of 1250 pounds. It has a depth of 6238 feet with casing set at 6220 feet. Oil is 42.5 gravity, corrected.

Empire Gas & Fuel Company's F. Hartman 1, west and a little south of the discovery oil well is a failure at 6276 feet, showing salt water in sand at 6269-76 feet. It cored shale at 6260-69 feet. A drill stem test at 6245-60 feet tested three fourbles of mud and no oil nor gas.

The Texas Company's Hackney 1, Rodrigues Survey, in the Martin area, several miles west of the field, has been abandoned at 6301 feet.

Among the active wells in the Port Lavaca field, The Texas Company is still trying to make W. A. Shofner 1 flow. It drilled to 6262 feet, tested salt water, plugged back to 6245 feet, perforated casing at 6220-30 feet and is now swabbing and jetting. It will flow for a short time, but then goes dead. Steinberger Petroleum Corporation's Shofner 2 is coring at 6077 feet. Halliburton Oil Production Company's D. Burton 3 is preparing to spud.

NEW GRETA SAND

Is found 400 feet deeper than previous pay level

San Antonio.—A new sand, 400 feet deeper than the former deepest level, has been uncovered in the Greta field of Refugio County by Hewitt and Dougherty. M. F. Lambert 19, north end of Block 21, Hardwick Survey, on the extreme south side of the field, is in sand at 6260-67 feet, where a drill stem test developed better than 1000 feet of 39 gravity pipe line oil and a nice pressure in 10 minutes. Preparations are being made to drill plugs on the casing.

This new discovery comes at a time when practically every proven location on the structure has been drilled. The main level of the field is at 4400 feet with some production at 3500 feet and 5800 feet.

PREMONT TEST SHOWS

San Antonio.—Magnolia Petroleum Company's A. A. Seeligson 6, deep test in the Premont field of Jim Wells County, has a sand at 6659-63 feet carrying a good oil odor. The first drill stem test failed and a second test is to be attempted as soon as more reaming is done in the hole.

KLEBERG SHOWING

San Antonio.—Fidelity Exploration Syndicate's Paul O'Henry 1, about one half mile southwest of the main producing area of the Kingsville field, Kleberg County, showed a heavy gas pressure at 2185-2213 feet in a sandy section. It is now drilling at 2342 feet, due to pick up another sand. The well is in Lot 2, Section 49.

SOUTH TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BASTROP COUNTY—		
Malone & Owens, Spooner 1, 500 ft nl, 3550 ft swl L. Leverenz sur..	*	2170
BEE COUNTY—		
Dirks Bros., Harris 4, C. A. Dugat sur (Dirks)	850	3906
Johnson 1, 1050 ft sl, 150 ft el tr in J. M. Uranga gr	*	4370
Simms, Renno 1, se sec 21, Uranga gr (W. Tuleta)	*	4013
Stanolind, Walton 2, sw sec 21, Uranga gr (W. Tuleta)	300	3939
BEXAR COUNTY—		
Chew et al, Jones 4, sec 9, J. Pena sur (Adkins)	*	722
CALDWELL COUNTY—		
Ogden & Reed, H. Brewer 1, 1000 ft nel, 150 ft sel 100-ac tr, Martinez sur	*	1745
CALHOUN COUNTY—		
Empire, Hartman 1, M. Sanchez sur (Port Lavaca)	*	6276
Halliburton Oil Prod. Co., Burton 2, M. Sanchez sur (Port Lavaca)	350	6238
Texas Co., Hackney 1, 1504 ft sl, 466 ft wl of 125-ac lease, B. Rodrigues sur	*	6301
DUVAL COUNTY—		
Bridwell Oil Co., Sutherland 1-A, sec 122 (Hoffman)	100	2713
Dulce Oil Co., Serna 1, nw sec 384 (Seven Sisters)	*	2675
Humble, Hubbard 2, sec 84 (Loma Novio	406	2810
Wood-Welder 1-D, sec 72 (Loma Novio)	240	2731
Magnolia, Duval County Ranch 47, sec 208 (Gov't Wells)	45	2355
D. H. O'Byrne, Ball 1, 330 ft sl and wl nw sec 3, Agua Poquita gr	*	4423
Santa Clara Oil Co., Wood Welder 2, sec 385 (Seven Sisters)	500	2468
Seaport Oil Co., Duval County Ranch 4-B, sec 576 (Sarnosa)	80	2407
Smith & Story, Lundell 14, sec 48 (Gov't Wells)	100	2208
Stewart & Parr, Bishop Cattle Co. 1, 330 ft sl and wl ne sec 74	*	3009
HIDALGO COUNTY—		
Harrison, Davis & Bishop, Guerra 2, sh 12, por 41 (Samfordyce)	250	2757
KARNES COUNTY—		
Pagenkopf et al, Sahm 1, 330 ft nl and wl 160-ac tr, E. H. Garrett sur No. 257	*	2346
LIVE OAK COUNTY—		
Lion O&R Co., P. E. McNeill Est. 8, blk 9, Jane Curry sur (McNeill)	150	4381
McMULLEN COUNTY—		
Texas Inland O&G Co., Lark 1-A, 150 ft s of nl and 75 ft e of Possum Creek, M. O'Boyle sur	*	893
NUECES COUNTY—		
Magnolia, Baldwin 1, 330 ft nl and wl J. S. McGregor sur No. 39	750	3879
STARR COUNTY—		
W. W. Zimmerman, Doyno 1, blk 1, tr 4, por 81	75	1450
VICTORIA COUNTY—		
Gillespie & Superior Oil Co., J. Janis 1, lot 9, Nancy Dean sur (Placedo) pb 4747 ft	425	4756
Trans-State Oil Co., Robt. Kanster 1, R. Manchola grant (½ mi w Coleto Creek field)	200	2833
WEBB COUNTY—		
American Liberty Oil Co., A. M. Bruni 3-C, sec 7, Arispe gr (Cole-Bruni townsite)	*	3407
Mills Bennett, J. Lopez 2, w½ tr 3-B, sec 73	500	2174
O. W. Killam, A. M. Bruni 38, sec 6, Arispe gr 4 (Cole-Bruni townsite)	¶12	2280
Magnolia Pet. Co., S. Benavides 2-G, blk 186, Hale sub, Arispe gr (Cole)	425	2768
ZAPATA COUNTY—		
Danvers & Harrison, N. J. Vela 1, 686 ft nel, 300 ft nwl blk 7, Vela sub, por 29	*	2360
Kleiner & Hill, J. Guiterrez 12, sh 4, Comitas gr (Escobas)	*	1254
Trevino 19, blk 14, sec 65 (Escobas)	*	lcn.
Texas Co., Measles 71, Cerrito Blanco gr (Escobas)	*	1277

*Failures; †Junked; ¶Million cu. ft. gas.

NEW NUECES FIELD

Opened in Corpus Christi area during the week

San Antonio.—Magnolia Petroleum Company definitely opened a new low gravity coast field in Nueces County July 9 through the completion of J. C. (Bobby) Baldwin 1 for an initial flow of 18 barrels of oil per hour through ¼-inch choke. It is showing a very low pressure, but the tendency is to build up. Sand is recorded at 3874-79 feet, corrected depth, elevation 58 feet, derrick floor, seven-inch casing set with 500 sacks cement at 3874 feet. The oil is 25.8 gravity.

This well is located 330 feet from the north and west lines of a 160-acre tract and J. S. McGregor survey No. 39. It is four miles south of Clarkwood, southermost producing portion of the Saxet field, and is about six miles west of Corpus Christi.

Magnolia Petroleum Company holds more than 1000 acres in the general vicinity with several other operators holding stuff fairly close in.

The new field is less than five miles from pipe line outlet and is not more than 10 miles from a deep water port at Corpus Christi.

New Saxet Sands

The Saxet field was receiving a producer in a new sand late in the week. A. F. Holliday's J. Griffith 1, George Frank Survey, No. 416, is at a total depth of 5602 feet. On a drill stem test at 5598-5602 feet, it showed 295 pounds working pressure, and some 56 gravity oil and mud, tests being made through ⅜-inch chokes, top and bottom.

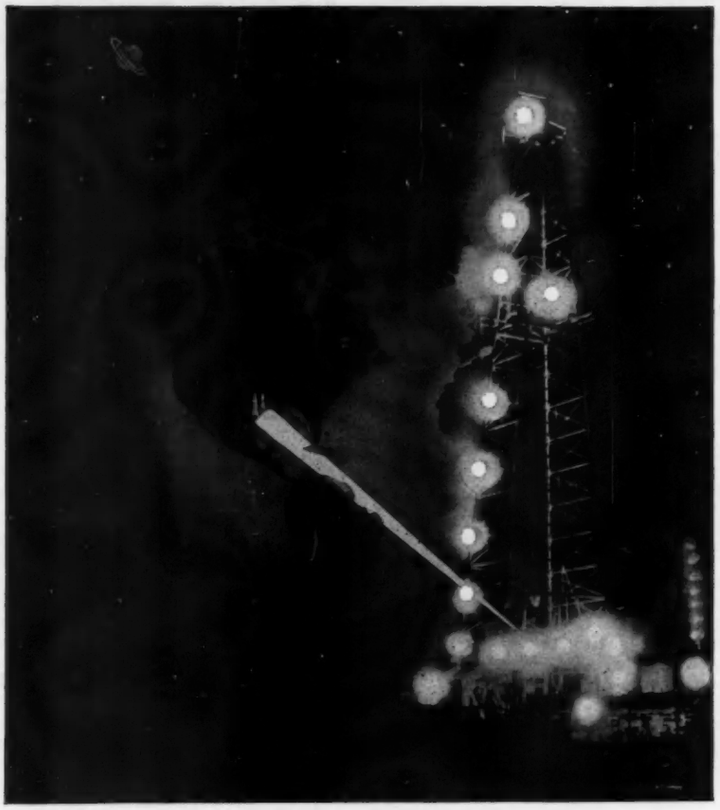
VICTORIA COUNTY

Coletto extended, new Placedo sand improved

San Antonio.—The new 4750-foot level in the Placedo field, Victoria County, now appears to be the main source of production. All tests thus far drilled to the 6000-foot sand, discovery level, including offsets to the first well, have failed to produce.

Magnolia Petroleum Company's Henderson & Pickering 1, east offset to the discovery, drilled to 6394 feet, plugged back to 4750 feet, set seven-inch casing at 4377 feet and is completing. Gillespie and Superior Oil Company's Brandt 1, south offset to the first well, drilled to 6255 feet, plugged back to 4000 feet, sidetracked and is re-drilling to the shallower sand. Same operators' J. Janis 1, west offset to the discovery well, plugged back from 4756 feet to 4747 feet and completed as an oil well.

Eastern Texas Oil Company is preparing to plug back Henderson & Pickering 1, which is at 6029 feet, failing to make a well in the 6000-foot sand. Martex Oil Company's Mitchell 1, southeast of the discovery well, showed gas at 4735-48 feet, but is drilling ahead. Eastern Texas Oil Company's Schovajsa 1, one mile southwest of the discovery, is having trouble



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in completing. Hole was plugged back from 4789 feet and casing perforated at 4760 feet. The hole now is full of oil and makes an occasional head. Efforts are being made to increase its power.

Coletto Extended

Coletto Creek, another Victoria County field, was given a one half mile west extension through the completion of Trans-State Oil Company's Robert Kanster 1, which flowed at the rate of better than seven barrels per hour through ¼-inch choke, showing tubing pressure of 640 pounds and casing pressure of 1100 pounds. It had sand section from 2813-33 feet, oil being encountered in the last five feet, at which point casing was set. Elevation is 82 feet derrick floor.

GAS WASTAGE SUIT

Constitutionality of new Texas gas law attacked

San Antonio.—A suit, which will test the constitutionality of the new Texas gas wastage law, has been filed in the local Federal District Court by Clymore Production Company and Nueces Refining Company, both of Corpus Christi. The suit involves the closing of a number of producing wells in the Agua Dulce field of Nueces County by the Texas Railroad Commission.

The application of the two producing and refining concerns was made to the district court for an order restraining the Railroad Commission from closing the wells, the plaintiff's alleging that their 4900-foot producers were oil wells, despite the fact that many thousands of cubic feet of gas was blown into the air to produce a single barrel of high gravity oil. The hearing was held before Federal District Judge July 9, refusing the order. Had the judge held that the wells were oil wells, instead of gas wells producing a quantity of oil, and the restraining order granted, the wells would have been allowed to flow until completion of the case.

The case will be tried on its merits about July 16, either in San Antonio or Houston, when a three-judge court is scheduled to hear such proceedings. Judge Rufus Foster, of the Fifth Circuit Court of Appeals, New Orleans, Judge McMillan, and another district judge, will sit. The outcome of this suit and others to be tried at the same time will have an important bearing on the future of the gas wastage law.

William C. Davis and A. D. Gray, assistants to the attorney general, represented the Texas Railroad Commission.

CAESAR SPACING

Austin.—A hearing to consider revision of spacing rules in the Caesar field, Bee County, has been set for July 18 by the Railroad Commission.

Operators in the field have complained of the current ten-acre spacing rule. The field is bounded by faults, and as a result, most of the locations made must be exceptions to the regular spacing rule if the wells are to be located in the producing area.

Wildcat Has Oil

LIBERTY COUNTY TEST MAY OPEN A FIELD AT HARDIN

WEEKLY STAFF REPORT

Houston. — Evidence of a new oil field was shown July 11, 1935, when Jack Frazier's Lynott Buffon 2, three miles north of Hardin, Liberty County, made a drill stem test 311 feet in the Cockfield formation.

The test was made from 7652 to 7675 feet, and showed eight and one half stands of pipe line oil through a quarter-inch choke on top and bottom. Some estimated the well making a barrel per minute on the test. The oil tested 36.9 corrected gravity with a pressure of 30 pounds. The test was made in 10 minutes and showed one and half joints of sand and one joint of brackish water. It is reported that the well has between 10 and 16 feet of saturated oil sand. At the end of the week the operators were preparing to run seven-inch casing.

The hole was drilled to 7851 feet, and plugged back to 7550 feet to test sand from 7665 to 7681 feet which was missed while coring. An electrical logging device showed sand from 3001 to 7848 feet. The possible discovery well topped the Warreni at 3794 feet, Massilina Pratti 6300, Hockleyensis 6445 and the Cockfield at 7341 feet.

The test is located 7500 feet east of Lynott Buffon 1 and 466 feet west of the east line and 466 feet north of south line of the southeast 60 acres or 858 acre tract or approximately 1250 feet north of the south line and 1100 feet west of the east line of J. Robeson Survey, Liberty County.

This test is the second well to be drilled in the area by Jack Frazier. The first test was abandoned at 7511 feet, after running over 500 feet higher than any other well drilled in the area. Lynott Buffon 1 topped the Cockfield at 7045 feet.

Those who hold acreage in the area include: Jack Frazier, Humble Oil & Refining Company, Gulf Production Company, Atlantic Oil Producing Company, Amerada Petroleum Corporation, Magnolia Petroleum Company, Shell Petroleum Corporation, Sun Oil Company, Crown Central Oil Company, Bishop Oil Company, Fohs Oil Company, L. W. Wicks, Mills Bennett Oil Company, Cranfill & Germany, Turnbull & Irwin & Woodley Petroleum Company, Leon Russ & W. Goldson, Edwards Drilling Company, East Texas Drilling Company, Arkansas Fuel Company, W. P. Henry, Atlatl Royalty Corporation and several others.

Hankamer Producer

Another deep producer was added to the Hankamer field, Liberty County, during the past week, when Gulf Production Company completed Boyt 22, for 245 barrels per day from 5042 feet, with the bottom of the hole at 5085 feet. Nine and five eighths-inch casing was set at 5042 feet. The well was making some salt water at the close of the week through a quarter-inch choke with 350 pounds on the tubing and 900 pounds on the casing. The test is located in the Allen Survey, being 630 feet east of Gulf Production Company's Crow & Jacobs tract which was the first deep producer brought in.

Conroe Extended

The Conroe field, Montgomery County, was extended 1500 feet southwest during the past week when Humble Oil & Refining Company's South Texas Development Company A-74 came in at the rate of 35 barrels from 5085 feet through a half-inch choke with a tubing pressure of 450 pounds and casing pressure of 125 pounds. The operators have made location for South Texas Development A-75. The production in A-74 is coming from the Upper Cockfield sand.

To the northwest of Conroe and in the Willis area, Charles Gholson's A. Parks 1, Lindley Survey, has been temporarily abandoned at 3767 feet. The operators are moving the rig over to drill Delta Land & Timber Company 1, located in the J. Hostetter Survey. It is approximately 440 feet from the east line and 2150 feet from the north line of the survey.

Harris Test Abandoned

Another test was abandoned on the Ogburn prospect in Harris County during the past week when Hebert, Still & Hooper's A. Backman 1, tested salt water in the Cockfield formation from 6416 to 6448 feet.

The hole was drilled to 6516 feet and from 6435 to 6448 feet a gas showing was reported. Upon making a drill stem test from 6412 to 6448 feet the seal slipped and the test was made from 6416 to 6448 feet. The drill stem test was made in 17 minutes and showed 12 stands of salt water through quarter-inch chokes on top and bottom. The test showed no oil or gas.

A. Backman 1 topped the Hockleyensis at 5333 feet and the Cockfield at 6302 feet. Compared to other wells drilled on the same prospect it was running about normal.

The failure is located 990 feet west of the east line and 4290 feet north of the south line of J. Ogburn Survey, Harris County.

In the area of the San Jacinto Battle Grounds, Harris County, it is reported that an independent oil broker is paying $25 per acre for leases. It is reported that the acreage will go to a major oil company.

GAS DISCOVERY

Orchard outpost test has big gas flow in new sand

Houston.—The Orchard field, Fort Bend County, was the scene of intensive excitement during the past week when Gulf Production Company's J. M. Moore 43, extended the field to the west and discovered a new Eponidiz Yeguaensis (Upper Saline Bayou) sand. The well blew out and caught fire on July 7, 1935.

While drilling out cement plugs in the new sand, found from 6559 to 6564 feet, the well blew in and ignited from friction in the pipe. Seven-inch casing had been set at 6650 feet.

A local fire fighting concern was called in and had successfully converted the flame away from the derrick after blowing through the drill stem for several hours. The 122-foot steel derrick was pulled over and the fire fighters turned the flame back through the drill stem before capping.

The well was estimated making from 50,000,000 to 60,000,000 cubic feet of gas daily from the Eponidiz Yeguaensis sand. The test made no oil. The Cockfield was topped at 6521 feet.

Gulf Production Company's Moore 43, is located 350 feet along the south line of the southwest corner of the German Emg. Company Survey and 740 feet north at right angles to said line of lease and 350 feet east of Moore 3. The well is nine miles northwest of Rosenburg, Fort Bend County.

CORE OIL SAND

Anahuac wildcat cores oil sand at 6930 feet

Houston.—Excitement was running high during the past week among the Texas Gulf Coast operators when it was reported that R. A. Mason and Glenn McCarthy's R. M. White 1, Chambers County, had cored from 20 to 30 feet of oil sand and had ordered out casing to be set. The well is reported to have topped the oil sand at 6930 feet with the bottom of the hole at 6950 feet.

The wildcat is located 466 feet out of the southeast corner of R. M. White 976-acre tract, being approximately 3125 feet north of the south line and 466 feet west of the east line of J. McGahey Survey. It is northwest of the town of Anahuac, and one and three quarters miles north of the Anahuac field which was discovered recently by Humble Oil & Refining Company.

Anahuac Field

In the Anahuac field, Humble Oil & Refining Company completed Clark 2, west offset to Clark 1, H. & T. C. Survey, Section 57, for 30 barrels per hour from 7095 feet with the top of the oil sand at 7095 feet. Tubing pressure was 1125 pounds; casing pressure 1200 pounds. The same operator's Broussard 3, 1000 feet southeast of Broussard 1, was waiting on cement to set at 7100 feet at the close of the week. The top of the gas sand was found at 7028 feet.

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ANGELINA STRIKE

County's first pool may be result of showing

Houston.—It was indicated that Lee Tex Oil Company's A. H. Geisler 1, near the town of Lufkin, B. J. Thompson Survey, Angelina County, July 6, 1935, may become the discovery well for a new oil pool in that area when the well made a head of oil with a large volume of gas from 2053 feet. It is undetermined whether the well is producing from the Carrizo sand or the Queen City formation.

On July 6, 1935, the operators set screen and liner and swabbed the test for six hours. The wildcat showed very little gas and a trace of oil. The well was then shut in and the pressure built up to 650 pounds on the tubing and 775 pounds on the casing. It was opened through a quarter-inch choke and showed a light spray of oil with no water. The test finally went dead.

Upon lowering the tubing the possible discovery well made one head of oil estimated at five barrels which blew over the derrick and after the head was made the wildcat started making gas, mud and wash water after the tubing pressure decreased to zero and 300 pounds on the casing. At the close of the week the operators were letting the test blow and was making only gas and mud and wash water.

The test is producing from broken sands from 2031 to 2053 feet. Six and five eighths-inch casing was set at 2020 feet.

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FIRST PIERCE OIL

New field discovery test makes 18 barrels hour

Houston.—The first commercial production was received from The Texas Company's Pierce Estate A-2, the discovery well for the new Pierce field, Wharton County, July 10, 1935, when the wildcat made 16 barrels of 23.9 corrected gravity oil through a quarter-inch choke from the Frio-Marginulina sands from 4704 to 4710 feet. Tubing pressure was 325 pounds; casing pressure 390 pounds. The well showed no salt water. July 11, 1935, the well was cleaned and making 18¾ barrels per hour through a three quarter-inch choke. Tubing pressure 575; casing pressure 590 pounds.

Seven-inch casing was set at 4710 feet and the casing was perforated. The well was completed the latter part of June making 12 to 18 barrels of fluid per hour from 4693 to 4704 feet. The fluid showed 40 percent drilling mud, basic sediment and oil with the remaining 60 percent washwater. The flow was through a quarter-inch choke with 1640 pounds on the tubing and 1890 pounds on the casing. The well showed a large volume of gas and no salt water. The well was later killed due to the high gas/oil ratio due to a leak in the nipple under the master valve.

Upon killing the test the operator cored six feet deeper from 4704 to 4710 feet and set seven-inch casing and then run the perforating gun and shot 20 holes then brought the well in as a producer. The operators have constructed a two or three car loading rack on the Southern Pacific Lines and are carrying oil out in tank cars.

TEXAS GULF COAST

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANAHUAC—		
Humble, Clark 2	720	7095
ARRIOLA—		
Republic Prod. Co., Arriola 6	¶2½	4071
Arriola 12	¶1	3721
BATSON—		
John Deering, Bullock 1	*	6294
BLUE RIDGE—		
San Jacinto Oil Co., Blakely 7	400	4372
CLAY CREEK—		
Sun, Janner 14	215	1375
CONROE—		
Gulf Coast Oil Co., Becker 2	480	5075
Bertrand 3	470	5010
Humble, So. Tex. Dev. Co. A-74	840	5085
Texas Osage Oil Co., Osage 6	120	5076
HANKAMER—		
Gulf, Boyt 22	245	5085
HASTINGS—		
Stanolind, H. H. Ford 1	168	6124
Sneed 3	120	6100
MANVEL—		
Texas Co., F. Lieder 4	¶1	3994
MARKHAM—		
Hamil & Hamil, Kountz 2	*	5223
MYKAWA—		
West Prod. Co., Lee 1	*	5001
Forbes 1	*	5026
LIVINGSTON—		
T. A. Carlton, Watt 2	540	4232
Sun, Pratt 4	¶2	4252
RACCOON BEND—		
Humble, A. T. McCasland 6	1725	4082
TOMBALL—		
Humble, H. Quilter et al A-6	586	5562
HARRIS COUNTY—		
Hebert, Still & Hooper, A. Backman 1, Ogburn area, J. Ogburn sur	*	6516
TRINITY COUNTY—		
Gulf, Trinity County Lbr. Co. 3, s of Apple Springs, A. E. Westall sur	*	3009

*Failures; †Junked; ¶Million cu. ft. gas.

OPEN BRYAN MOUND

Commercial oil for old prospect appears likely

Houston.—The first commercial oil production loomed last week on the Bryan Mound prospect in Brazoria County, when The Texas Company's Freeport Sulphur Company 1, was being swabbed on July 12, 1935. The fluid showed five percent mud, 20 percent wash water, two tenths of one percent sand and 75 percent oil. It is reported that there is 200 feet of fine floating sand in the bottom of the hole. The operators set 90-mesh screen in the hole. It was reported at the end of the week that the well was making 50 barrels per day by heads.

Should this well prove a commercial producer it will establish a new oil field for the Texas Gulf Coast, making two discoveries in the area within a month for The Texas Company.

The hole was carried to 4544 feet in heaving shale and was plugged back to 3969 feet. Nine and five eighths-inch casing was set at 4107 feet. Casing was cemented from 3382 to 3800 feet and the Miocene sand was perforated from 3425 to 3435 feet. The well flowed wash water and oil at the rate of 400 barrels per day on July 9, 1935 and then stopped flowing. The swab was run and the operators received oil, mud and wash water with a 400-pound pressure on the casing. The operators were unable to get the test to kick off. The fluid was standing at 1200 feet in the hole. July 10, 1935, the operators were swabbing part time and the well would flow for a short period. On several heads of oil it was estimated at 1000 barrels per day through a three quarter-inch choke, then later after the well had made several heads of oil it was estimated making only 50 barrels per day through the same size chokes. Tubing pressure was 750 pounds; casing pressure 450 pounds. The oil tested 36.6 corrected gravity.

The Bryan Mound is located approximately two miles southwest of Freeport and due to gas seepage and a "high" in the area introduced the first drilling in 1901 when J. M. Guffy Petroleum Company completed a well at 900 feet for 6,000,000 cubic feet of gas daily. Since then there has been approximately 16 tests drilled for oil and all have failed to encounter any commercial production. Since 1914 Freeport Sulphur Company has been mining sulphur in large quantities. The sulphur is produced from the cap rock which is topped around 700 feet. Salt is encountered around 1136 feet.

The Texas Company's Freeport Sulphur Company 1, is located approximately 2500 feet east of the Canal and 2764 feet north, 1184 feet west of the northwest corner of the S. E. Austin Survey in the Areola Survey or 4500 feet from the north line and 4800 feet from the west line of 3622-acre tract.

New Hastings Locations

In the Hastings field of Brazoria County, Stanolind Oil & Gas Company has made three new locations to be drilled simultaneously. Dora Frank Guido 1, is located in the H. & T. B. Survey No. 36 and is 330 feet north and 990 feet west of the southeast corner of Guido 40-acre lease. The new location is a direct north offset to Hutcheson 1. S. A. Pennock 1, is in the H. & T. B. Survey, No. 36 and is 330 feet north and 990 feet west of the northeast corner of Pennock 40 tract. The well being a north offset to Guido 1. Laura D. Shaw Estate 1, is 330 feet south and 330 feet west of the most easterly northeast corner of Laura D. Shaw 120-acre lease. The test is a west offset to Hutcheson 1.

Stanolind Oil & Gas Company's Hutcheson 1, was preparing to set casing at the close of the week around 6052 feet. The well had saturated oil sand at 5764 feet. M. Kidd 1, 1000 feet east and north of the discovery well was waiting on cement to set at 5992 feet after topping an oil sand at 5985 feet.

NEW VAN VLECK SAND

Houston.—A new oil sand has been discovered in the Van Vleck field, Matagorda County in Skelly Oil Company's Cobb 3, which flowed pipe line oil over the derrick July 11, from 7488 feet. On a drill stem test from 7483 to 7488 feet the well was opened 25 minutes through a quarter-inch choke on top and bottom and in 15 minutes the well started flowing pipe line oil over the derrick. It flowed for 10 minutes. The operators recovered 10 thribbles of oil from the test. The well will be cored deeper.

A sand was topped at 7477 feet and drilled to where the drill stem test was made. The well is 400 feet deeper than

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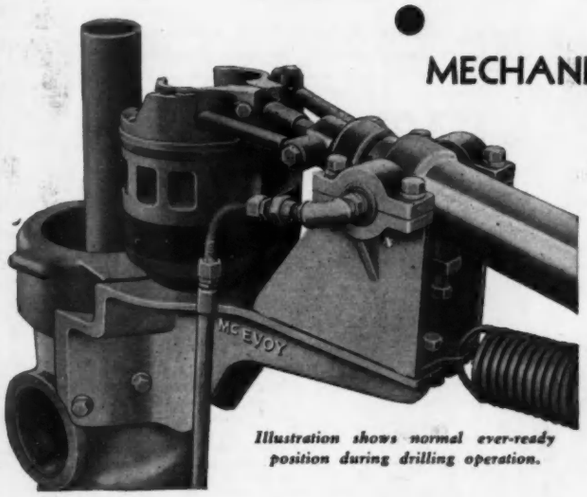

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the regular producing horizon for the field. It is reported that it has discovered a new Frio producing sand. The field has been producing from the Marginulina formation. Cobb 3 topped the Marginulina at 6581 feet.

The well is 2235 feet northeast of the discovery well or 740 feet from the northwest line and 900 feet from the southwest line of M. Cummings Survey.

To the northeast of this field and in Wharton County, Shell Petroleum Corporation's A. & E. Steves 1, southeast of Louise, was coring at 4531 feet at the close of the week after topping the Heterostegina at 4140 feet. This is becoming one of the hottest wells on the Gulf Coast as it is reported running higher than others drilled in the area.

LARGE GILLIS WELL

Field has been divided into two separate areas

Lake Charles.—The largest and best well to be completed in the Gillis or English Bayou field, Calcasieu Parish, is Fohs Oil Company's Wasey 1, which was finaled for 780 barrels of pipe line oil per day through a quarter-inch choke from 7074 feet.

The oil sand was topped at 7032 feet and seven-inch casing set at 7036 feet. Presssure was 1300 pounds on the tubing and casing. The well is located 275 feet each way out of the northeast corner of the SE-4 of the SE-4 of Section 14-9s-8w.

The same operator's Airhart 1, quarter-mile west of Wasey 1, is expected to be completed soon for another good producer. At the end of the week it was at 6931 feet in gas sand, and was coring.

Five hundred feet north of Fohs Oil Company's Castle 1, which was formerly the best well in the field, and in the Gillis field, Union Sulphur Company abandoned its O. H. Castle 1, at 7804 feet after plugging back and trying to sidetrack.

Union Sulphur Company's Powell Lumber Company 2, Section 12-9s-8w, was preparing to make a drill stem test at 6714 feet. The hole was drilled to 6877 feet, and was plugged back to 6600 feet. The company is working over Powell Lumber Company 2.

Union Sulphur Company's State 9, northwest offset to The Texas Company's Nickerson fee 2, Section 12-9s-8w, was completed during the past week as a gas well along with a spray of oil. The operators were letting the test blow and try and convert into an oil producer. The hole was drilled to 6755 feet in sand showing oil. From 6740 to 6745 feet the operators had a sand showing oil. Seven-inch casing was set at 6740 feet and the well came in for a gas well through a half-inch choke with 2350 pounds pressure.

The Texas Company's Nickerson fee 4, 2063 feet north and 4473 feet west of the southeast corner of Section 12-9s-8w, was being completed during the past week and at the close of the week a production gauge was not available. The bottom of the hole is 6936 feet. On a drill stem test from 6750 to 6768 feet the well showed 19 thribbles of salt water. The test was made in 13 minutes.

The State Department of Conservation in Louisiana has now designated the Gillis field as two separate fields. The Gillis field proper is being operated by Union Sulphur Company and The Teaxs Company. The allowable for the field is 4,750 barrels daily. The English Bayou field, which was part of the Gillis field, is being operated by Fohs Oil Company and the allowable for this field is 1750 barrels per day for July.

Lake Charles.—Completions along the Louisiana Gulf Coast during the past week were few in number. There were five completions in the area of which three resulted in flowing wells with an initial production of 1448 barrels per day. The remaining two completions were failures.

LOUISIANA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ENGLIS BAYOU—		
Fohs Oil Co., Wasey 1	780	7074
GILLIS—		
Union Sulphur Co., O. H. Castle 1..	*	7804
IOWA—		
Magnolia, Waite 1 (wo)	*	6961
Shell, Heyd 16	518	6894
ROANOKE—		
Shell, Kratzer 4	150	7839

*Failures; †Junked; ‡Million cu. ft. gas.

CLEAN YOUR WELLS *QUICKLY ECONOMICALLY*

PAYS FOR ITSELF ON THE FIRST WELL

MILLER

COMBINATION BAILER and SAND PUMP

STAR BOTTOM

Used for cutting the sand loose.

SAND PUMP

Used when tools are run and when well is shot to quickly remove loose material.

BAILER BOTTOM

With the Bailer Bottom installed the Miller is changed to a Bailer giving you a combination of either a Bailer or Sand Pump in one tool.

The Miller Sand Pump is the tried and PROVEN tool for quickly cleaning wells, increasing production and cutting down shut-down time. It is the tool with world wide acceptance—with its *four* type bottoms the MILLER will clean out faster, last longer and cost less than any tool of its kind—specify the MILLER—it will pay for itself in YOUR first well cleaned!

Check These Features

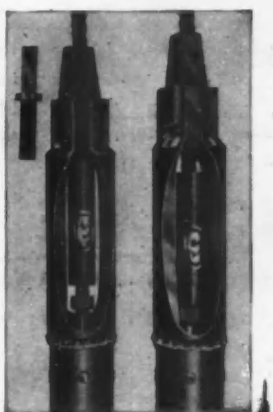
1. Standard Bail, Rope Socket Neck unscrews, lock comes out so wire line can be removed from pump without cutting the wire line.
2. Bail electric welded to tube.
3. Drop forged eye bolt.
4. Long heavy plunger with ball and seat in bottom.
5. Seamless steel tube.
6. Bottom bushing shrunk to tube and electric welded.
7. Drop forged latch over heavy spring to hold bottom. Set screw for added safety.
8. Four type bottoms STAR, SAND PUMP, BAILER and CHISEL (shown in pump) Cutting edges of Chisel and Star Bottoms hard surfaced.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet.

(Special)

TOOL JOINT BAIL

Left: Illustration of Tool Pin Bail, shown with wire line and swivel ready for lock to be inserted holding wire line to bail. Right: Illustration of bail with wire line and swivel inserted in bail ready to run on socket. This type bail eliminates the necessity of using both a sand and drilling line, as the same swivel is used in socket with tools and connected to the eye bolt and plunger when the sand pump is run.



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Oil At Rodessa

300-BARREL AN HOUR WELL FROM BELOW THE GAS SAND

NORTH LOUISIANA

WEEKLY STAFF REPORT

Shreveport, La.—Presence of oil in large commercial quantities below the gas producing horizon in the oolitic lime horizon of the Glen Rose, upper Trinity, in the Rodessa field, northwest Caddo Parish, was proven last week when United Gas Public Service Company's I. L. Young 1, SE SE 21-23n-16w, Friday afternoon was making 100 barrels of light oil per hour from sandy Oolitic lime of Glen Rose age at total depth of 6048 feet. Pressure on the tubing is 910 pounds and on the casing 1820 pounds.

After two 1000-barrel tanks are filled it is planned to kill the well due to a leak in seven-inch casing cemented at 5590 feet and run a string of five-inch. No water has appeared.

Early Friday the well was allowed to flow through a three-quarter-inch choke on the tubing and a half-inch-choke on the casing for half an hour at the rate of 300 barrels per hour.

Gravity Increases

An increase in the gasoline content of the crude was noted Friday after the well had been opened. The present gasoline content being placed at 35 percent. The gravity also changed from 41.6 Beaume in a sample secured early in the week to 46.8 gravity in a sample Friday. The gas-oil ratio is 450 cubic feet per barrel.

Seven-inch casing had been cemented at 5590 feet. The well is one mile north of nearest of the 20 gas producers in the Rodessa field which has produced heretofore a gas heavily saturated with gasoline which runs 600 to 1000 gallons per million cubic feet. United Gas Public Service Company has a large extraction plant for this gas at the village of Myra near Rodessa.

The discovery gas well in Rodessa was completed in French 1, Section 33-23n-16w, August 5, 1930, by Richard W. Norton of Shreveport, at 5617 feet. He later sold his original block of 6000 acres to United Gas Public Service Company, retaining his oil rights on the leases. Norton later added approximately 20,000 acres to his holdings in that area and United Gas Public Service Company now has about 20,000 acres and owns the gas rights on most of Norton's leases but owns both oil and gas rights on I. L. Young 1.

Acreage Leased

No close-in acreage to this test is available. Arkansas - Louisiana Gas Company has four gas producers in the field and holdings in the immediate field of approximately 1000 acres. Leases that are available have soared in price and there has been considerable trading in leases and royalties. Haynes Oil Company of Shreveport secured 80 acres from the Zylks Estate in Section 9-23n-16w, a mile and one-half north of the well for $200 per acre, this being the top price paid so far for available acreage.

Geological Theory

The geological theory is that Rodessa is on a northeast-southwest fault starting in Cass County, Texas, and leasing and trading has extended as far southwest as Jefferson, Texas, and as far northeast as Ida, Louisiana. A distance of approximately 20 miles has seen the bulk of the trading.

Oil was first discovered in the Rodessa area in 1923 when J. U. Galloway and associates completed a 50-barrel daily pumper at the 2900-foot level but no other producers at that level were completed, although several tests drilled to 3300-3400 feet showed oil and gas. Norton's discovery gasser at the 5500-foot level revived interest in the area in 1930.

Rodessa is 45 miles north of Shreveport and is only a few miles from the Texas and Arkansas state lines. United Gas Public Service Company has two gas pipe line outlets from the field and Arkansas-Louisiana Gas Company has one pipe line.

The effect of the discovery of oil in the oolitic lime horizon of the Glen Rose in Rodessa will have the effect of renewing oil exploration in other parts of North Louisiana. A heavily-saturated gas is found in the same horizon at the 4300-4500-foot level in the Sugar Creek gas field, Claiborne Parish; in the Cotton Valley field, Webster Parish, and the Bethany field, Panola County, Texas, at about the same levels.

Bossier Test Wet

Richplain Oil Company's Gaines 1, NW NW 22-22n-13w, a wildcat in Bossier Parish, near Plain Dealing, which had logged 3½ feet of sand showing oil under cap rock at 2385 feet in Tokio, last week tested salt water with a slight show of oil; total depth is 2842 feet.

This test is 164 feet north of Scovell and associates' Gaines 1, in the same section that July 4, 1917, blew out and flowed a large amount of oil for a short time but could never be

Which?

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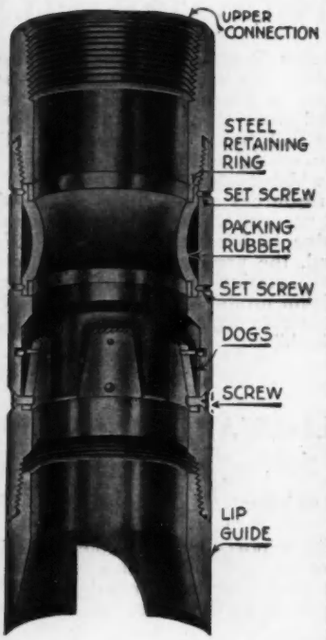
. . . a simple, quick job with the Gray Overshot to catch the pipe **before it becomes stuck.**



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GRAY TOOL COMPANY Houston, Texas.

revived. The present test is the tenth that has failed to find production in the vicinity of this old well.

Whether the test will be deepened has not been announced by the owners, who have a 2770-acre block. Six-inch casing had been cemented at 2835 feet, top of the cap rock.

Nine miles west of the old Oakland field, Union Parish, Louisiana, that had a few small oil producers in 1923 and later was abandoned, J. I. Roberts Drilling Company of Shreveport has assembled a 4000-acre block of wildcat acreage and has spudded Seale 1, SW SE SW 7-23n-1w, and last week was drilling below 1600 feet. Ten-inch surface casing was cemented at 195 feet. Contract depth is 3500 feet.

CONSERVATION BILL

Baton Rouge, La.—The last special session of the Louisiana legislature which adjourned July 8, the sixth called since the last regular session in May and June, 1934, enacted a bill by Representative Burke, House Bill No. 13, which is designed "to conserve the oil resources of the State of Louisiana and prevent waste and depletion thereof due to production in excess of demand, the production or the purchase, transportation or handling of crude petroleum produced * * * in excess of the reasonable market demand * * * is prohibited."

ALLOWABLE UPPED
South end gets all increase in Louisiana

Shreveport.—South Louisiana fields were allowed an increase of 7650 barrels in production for July over June, according to the latest proration order issued by Dr. J. A. Shaw, director of the minerals division, Louisiana Conservation Commission, in charge of allocations for the state. South Louisiana was hiked from 111,300 barrels in June to 118,950 barrels in July, the total allowable for the state for July being 139,950 barrels as compared to 132,300 barrels for June. North Louisiana's allowable was 21,000 barrels

Shreveport, La.—Twenty-one drilling permits were authorized last week by the minerals division, Louisiana Conservation Commission. Seven new tests were for North Louisiana divided among the following parishes: Bossier, one; Caddo, one; Caldwell, one; Morehouse, one; Ouachita, one, and Union, two. The fourteen in south Louisiana were divided among the following parishes: Calcasieu, one; Iberia, nine; Plaquemines, two, and St. Martin, two.

NORTH LOUISIANA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO PARISH (Pine Island)—		
Barnsdall Oil Co., School Fee 2, se nw se 16-20n-15w	25	2256
Nick Barbare & Ark. La. Gas Co., Ark-La. Gas Co. 1, se se 16-20n-15w	*	2285
Shreveport Oil Corp., Muslow C-1, nw nw 9-20n-15w	35	2174
CADDO PARISH (Blanchard)—		
Reese et al, Waskom 1, ne ne 30-19n-16w	*	1030
DE SOTO PARISH—		
Saffold et al, T. D. Thigpen 1, ne sw ne 33-13n-13w	*	1730
Foster et al, C. S. Youngblood 1, ne ne 9-11n-14w	¶1¼	2860
OUACHITA PARISH (Monroe)—		
Jordan, Tr., Rea-Green 4, ne se 2-18n-4e	¶⅛	2217
SABINE PARISH (Converse)—		
Whitehurst et al, Frost 1, se sw 20-9n-13w	30	1645
SABINE PARISH (Zwolle)		
Hunter Co., Sabine 16, se sw 12-7n-12w	*	2818

*Failures; †Junked; ¶Million cu. ft. gas.

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When you trade with us, you are close to the "bosses". No sudden changes of executives, district or credit managers, or policy which frequently inconvenience an operator. Our credit policy has helped many of our customers develop and build up their properties, in spite of unsettled conditions in the oil business, and general financial stringency. It will pay you to trade with us.

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STORES IN EAST TEXAS, NORTH TEXAS, CENTRAL WEST TEXAS

DEPTH RECORD
Smackover test plans to go through Permian salt

WEEKLY STAFF REPORT

El Dorado, Ark.—A new depth record for North Louisiana and Arkansas was established last week in Gulf Refining Company's Werner Lumber Company 49, SW NW SW 5-16-16, Union County, Arkansas, on the west side of the Smackover field, when this test reached 7486 feet in salt of Permian age. An 8000-foot test is planned.

The previous depth record for Arkansas and North Louisiana was held by Lion Oil Refining Company's Hayes A-9, Section 4-16-15, Union County, Smackover district, drilled several years ago to 7255 feet and abandoned in Permian salt.

Gulf Refining Company's test logged top of Permian salt at 6664.5 feet; elevation is 128.5 feet. H. L. Hunt, Incorporated's E. F. Gregory 15, SE SE 10-17-14, a deep test in the Rainbow City field, logged top of the Permian salt at 6816 feet; elevation is 180.4 feet. On the basis of sub-sea depth Gulf Refining Company's test topped the salt 100 feet higher than the Hunt test, which went to 6911 feet in Permian salt.

The theory held by many geologists at present regarding the Permian salt stratum underlying the Smackover and Rainbow City fields is that this is not a salt dome but a layer. Gulf Refining Company hopes to reach base of the Permian salt before reaching the 8000-foot depth.

Record Casing Set

Several weeks ago Gulf Refining Company's test set a new casing record for Arkansas and North Louisiana when a string of seven-inch was cemented at 6224 feet.

No other tests other than the two above mentioned have gone below 7000 feet in Arkansas. In North Louisiana only two tests have gone below 7000 feet. These are Magnolia Petroleum Company's McCook & Hibbler 1, Section 22-21n-10w, Webster Parish, Cotton Valley field, that went to 7002 feet; and R. L. Gay, Trustee's Long-Bell A-1, Section 10-18n-13w, Sabine Parish, that reached 7154 feet.

Arkansas had only one completion, a salt water hole abandonment in a wildcat test in Ouachita County, last week. There were no new locations announced and no drilling permits were authorized.

ARKANSAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
OUACHITA COUNTY—		
Snow-Black Pet. Co., O. F. Wyman 1, ne nw sw 36-11-16	*	1610

*Failures; †Junked; ¶Million cu. ft. gas.

Jal Field Widened

LEA COUNTY OPERATIONS CONTINUE AT BRISK RATE

WEEKLY STAFF REPORT

Hobbs, N. M.—Encountering hole full of oil from lime at 3336-3343 feet, R. H. Henderson et al's P. J. Langley 1, C SE SE 8-25s-37e, opens up new producing territory about one and three quarter miles northeast of Jal. It is situated about two and one third miles due east of nearest oil production in the North Jal field, and is apparently showing oil and gas from the same horizons, having a sub-sea depth of 181 feet. Oil production is found in the field proper at this depth. Langley 1 encountered a nominal gas flow at 2875 feet, registering 430 pounds rock pressure, but lost tools and had to sidetrack. A string of 5 3/16-inch protection pipe was cemented at 3194 feet. Gas production estimated at 1,500,000 feet daily was picked up at 3212 feet. Production test of the oil horizon has been delayed through lack of tankage.

Expansion of field operations in Lea County's principal oil areas and upon wildcat prospects continued unabated the past week, with eight new tests authorized. Eunice, Hobbs and Cooper fields added two each, while the remainder were wildcats. There were 17 tests launched during the two weeks previous.

Culberson & Irwin made locations for two wildcats to be drilled in the west portion of Lea County and to the west and south of the recent failure drilled by Jeffers Oil Company on the Etz-Conoco permit, resulting in an unusually high structural position being recorded with a show of oil immediately above the water horizon. The former will drill Eva Brown 1 at C NE NE 23-21s-32e, and Sue Richardson 1, C SW SE 10-21s-32e.

Arrest Sulphur Water

Spread of sulphur water through the Cooper field in recent months now promises to be partially arrested and eliminated in some wells, based on preliminary results scored by the committee of engineers and geologists assigned to study the menace and recommmend relief measures. Each well is a separate problem. The committee has suggested that an extra string of casing be cemented in some of the wells to reduce gas-oil ratios, else to cut off water overlying the oil zone, while other wells are responding to plug back jobs, and wall packers on tubing. Phillips Petroleum Company and Pure Oil Company's Woolworth 2, NWc NE SW 23-24s-36e, an acid treated well, responded to a "squeeze job," consisting of cementing off the upper portion of the exposed lime section, with a flow of 35 barrels hourly, two percent b.s. & w. on one-inch tubing choke, with gas-oil ratio of 400-1. Prior to workover this well gauged 350 barrels of oil and 149 barrels of water in 24 hours on 1½-inch choke.

Contrary to belief expressed by operators and drilling contractors in the Cooper field, the dry gas production found above the oil zone does not contain carbon-dioxide gas properties to promote a tendency to freeze equipment in the hole, a cording to an exhaustive survey conducted by an engineer for one of the operating units. The appearance of ice in a few wells, tentatively called "dry ice," was due to the sudden expansion of the high pressure petroleum gas in the presence of sulphur water, according to the analysis of the condition.

Cooper Field

Conversion of Humble Oil & Refining Company et al's J. L. Coates 1-A, relief well drilled on the north end of the Cooper field last April as a west offset to the company's wild gasser, into an oil producer was in progress last week. Formation tester used in lime at 3500-3560 feet, developed a flow of 44 barrels of oil per hour, indicating a good well in the making. The hole was drilled to 3390 feet to flood the gas zone in the uncontrolled well with water, and after several weeks of continuous pumping yielded results. The relief well has cemented 4¾-inch pipe at 3506 feet.

Interest in the Monument field now is centered on The Texas Company's Saunders 1, C SE SW 18-19s-37e, situated three and one half miles northeast of nearest oil production, due to the appearance of about 55,000,000 cubic feet of dry gas production, a record volume for the area, when the well unloaded itself at 3900 feet. The blowout was checked in short order, although the well threatened to crater because of split casing. A string of seven-inch has been cemented since at 3762 feet, and the coring of the entire lime section will be resumed. On the west flank of the Monument field, Superior Oil Company's State 1 is preparing to test for production near the 3920-foot level, while Sun Oil Company's Maveety 1, north offset, has cemented seven-inch pipe at 3790 feet. Amerada Petroleum Corporation and Jeffers Oil Company each have one active test to the south and southeast.

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Positively Assures a Millout Between Couplings

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Whipstock automatically set and locked at the point where you want to mill out. It will remain where set.

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If the hole has deflected, you can, by proper **orienting and setting, straighten up in the right direction, or get back to correct position.**

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CUT BANK ACTIVE

Southwest extension well holds 125 barrels daily

SOUTHEASTERN STATES

WEEKLY STAFF REPORT

Cut Bank, Mont.—Santa Rita Oil & Gas Company brought in a flowing well in the Cut Bank field this week, while seven other wells completed and six wells started. The above company's Fisk 1, CSW SE 14-35n-6w, completed for 150 barrrels flowing production initial with total depth at 2843 feet.

Pumps 125 Barrels

Gardner-Smith Syndicate's Tweedy 1, NE NE 36-33n-6w, which extended the field three miles to the southwest, pumped 125 barrels daily average on a 10-day test, and definitely proves the field to the southwest direction. Gardner-Smith Syndicate had made location for a second well on the Tweedy lease, and operating under the name of Custer Oil Company, the well will be carrried as Tweedy 1, NW NE 36-33n-36w, which is an outside location, 40 acres to the west of the same operators' extension well.

Other first reports which bring the total of Cut Bank operations to 30 with 22 drilling wells, six in various stages of rigging, and two as locations, are as follows: Olive Oil Company's Winkler 4, SE NE NE 35-35n-6w, rig on location. Montana Power & Gas Company's Bonnet 2, SW NW 4-32n-5w, rigging up. Santa Rita Oil & Gas Company's McCabe 2, Lot 2, Section 31-33n-5w, location. R. C. Tarrant's Larson 2, CW NE 12-34n-6w, location. The Texas Company's Yunck 3, CSE SE 14-35n-6w, spudding at 50 feet.

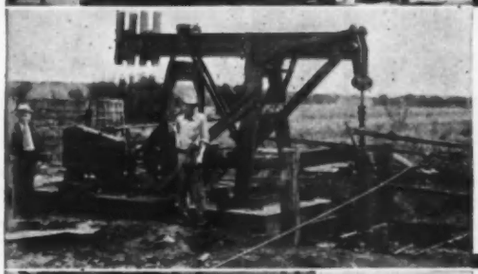
New Northern Montana Field

J. H. Hamilton Syndicate's Northern Farms 1, NE SW 10-37n-5e, brings in a new light oil field for northern Montana. The well completed a 10-day pumping test on July 2 and averaged 40 barrels daily. The well is shut down at 2875 feet for acid treatment. Tests of sample of the bottom hole sand indicated that the basal Kootenai formation at Flat Coulee is lime cemented and would respond favorably to acid treatment. One thousand gallons of acid will be used in treating the well. The Flat Coulee structure is in northern Liberty County, a few miles south of the Canadian border. The field embraces approximately 7000 acres within its lowest closing contour.

Daniels Petroleum Company is spudding May 1, CSE SE 13-1s-33e, in the Hardin gas field. The well is starting with a 15½-inch hole and will be the first test of the structure to go below the Frontier formation, where several gas wells have been developed at around 600 feet.

LOWER UPKEEP *and* LONGER LIFE *in* OIL WELL PUMPING

Waukesha XAHU 25 hp. to 35 hp. Pumping Engine, natural gas fuel, driving Lufkin Pumping Unit, in East Texas field, owned by Straube & Straube.



Waukesha XAHU 25 hp. to 35 hp. Pumping Engine, gasoline fuel, driving Jensen Straight Lift Jack and handling five wells, 2000 ft., 2-in. tubing, ⅝-in. rods at Frankell, Texas, near Breckenridge, owned by Conway Brothers.

Waukesha CHKU 45 hp. to 60 hp. Explosion-Proof Pumping Engine, designed for outdoor, all-weather service, natural gas fuel, driving Lufkin Pumping Unit in Oklahoma City field, owned by Carter Oil Co.

Waukesha XAHU 25 hp. to 35 hp. Pumping Engine, gasoline fuel, driving Jensen Unit, pumping 4000-ft. well in Southwest Texas, owned by The Texas Company.

Waukesha Engines, for all oil field applications, are made in sizes up to 300 hp. *Write for Bulletin 830.*

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

WAUKESHA ENGINES

RED MOUNTAIN

Gallup, N. M.—F. E. Bedichek of Santa Maria, California, is preparing to drill a joint well with James Bennet of Gallup on the Red Mountain structure, recently proved for shalllow high gravity production. The test will be located in Section 32-20n-9w, McKinley County.

D. J. Lingenfelter and Bennet's Lark 1, NW 29-20n-9w, was completed several weeks ago for 20 barrels daily of high gravity crude at 900 feet. Lingenfelter sold out his interests at Red Mountain to engage in the oil business in Wyoming. With a group of associates Lingenfelter has organized Black Hills Refining Company, which will drill a deep test on the east end of the Lance Creek field, Niobrara County, Wyoming.

UTAH MORRISON THICK

Logan, Utah.—Mountain Fuel Supply Company's Murphy 2 CSL NE NE 21-3n-24a Daggett County, in the northeastern corner of Utah, is finding the Morrison section thicker than expected. The well is drilling at 6372 feet in the shale. Its objective is the Sundance formation. The well had a total of 32,000,000 cubic feet of wet gas in the Dakota series.

WYOMING ROUTINE

Plan test of Tensleep formation at Big Muddy

Casper.—Four wells are under way in the Lance Creek field, Niobrara County, eastern Wyoming. One is near completion and one test started for the Sundance this week. Ohio Oil Company's Elizabeth Lamb 2, NE NW NE 33-36n-65w, an old well deepening from the Dakota, is drilling shale at 3358 feet just above its objective, the Sundance formation. Carrie Putnam 4, SW SW 33-36n-65w, has derrick up.

Argo Oil Company's Elliott 4, CNE NW 5-35n-65w, is spudding. The well will complete in the Sundance formation. Continental Oil Company's Schuricht 2, CSE NE 6-35n-65w, is drilling shale at 2820 feet.

Oregon Basin Pumper

The black oil fields of northern Wyoming had one completion and two first reports at the close of the week. The Texas Company's Orra Sonnars 3, CNE NW 29-51n-100w, Oregon Basin field, Park County, completed for 300 barrels daily on the pump. Hole bottoms at 3501 feet in the Tensleep.

In the Garland field, Big Horn County, the McAlpine Oil & Gas Company is moving in tools for Fee 22, NW 3-55n-97w. Peter Evanoff's McAllister 1, Lot 40, 2-55n-97w, is spudding.

Ohio Oil Company's Sidon Canal 2, Lot 40, SW SW SW 24-56n-97w, is cementing for lost circulation at 4695 feet. Byron Union 3, SE NW NE 22-56n-97w, is drilling shale at 2940 feet. Byron Union 4, SW NE 22-56n-97w, and P. G. Sessions 3, NWc 33-65n-97w, have derricks up.

In Hot Springs County, California Exploration Company's Government 2, W½ SW NW 7-44n-98w, Waugh Dome field, is drilling shale at 1827 feet. Argo Oil Company's Ellen 16, NE SE 14-44n-98w, Hamilton Dome field, is drilling 2395 feet.

Big Muddy Tensleep Test

Continental Oil Company has derrick built and is scheduled to spud Elkhorn-State 60, NW SW NE 9-33n-76w, within the next week. The well will test the heretofore unexplored Sundance and Tensleep formations in the Big Muddy field, Wyoming's third largest light oil field, located in Converse County, in the center of the state. The well is on state land leased to Elkhorn Oil Company of Casper, which turned to Continental Oil Company on a 50-50 operating agreement. Continental Oil Company's Whiteside 9, W½ NE SE 7-33n-76w, is drilling at 2070 feet.

The Wyoming California Petroleum Company's Whalem 1, SE SE SE 20-16n-104w, South Baxter Basin gas field, Sweetwater County, southwestern Wyoming, is drilling at 1020 feet with cable tools.

Craig, Colo.—The Texas Company's Iles Investment Company 2, Lot 4, 25-24n-92w, Iles Dome, Moffatt County, is drilling at 1181 feet and is headed for the Sundance formation.

MOUNTAIN STATES
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MONTANA		
GLACIER COUNTY (Cut Bank Field)—		
Santa Rita O&G Co., Gov. 1, cne sw 4-32n-5w	400	3084
Ritchie 1, cnw-sw 5-33n-5w	230	2804
Montana Power Gas Co.'s Lookoff 1, csw se 28-33n-5w	90	3034
Nadeau Bros. Coover 2, cne nw 17-33n-5w	198	2920
TOOLE COUNTY (Kevin-Sunburst Field)—		
E. B. Coolidge, Shaw 1, se ne 35-36n-2w	35	1534
WYOMING		
PARK COUNTY—		
Texas Co.'s Sonners 3, cne. nw 29-51n-100w	300	3501
SUBLETTE COUNTY—		
Texas Co., Calpet 4-k w½ sw se 34-27n-113w	30	824
WESTON COUNTY—		
Herbison & Sons, Draper 3, sw sw sw 15-46n-63w	5	200
NEW MEXICO		
LEA COUNTY (Cooper Field)—		
Continental-California Co., D. L. Vaughan 3-A-15, c ne ne 15-24s-36e	2160	3538
Amerada, N. Everett 3, c ne ne 34-24s-36e	500	3495
Gypsy, State-Arnott 2-A, c nw ne 2-25s-36e	539	4000
Stanolind, A. E. Meyer 4-A, c ne sw 22-24s-36e	265	3620
LEA COUNTY (Wildcat)—		
Todd & Texas Co., Cole 1, c ne ne 35-19s-33e	*	4150

*Failures; †Junked; ¶Million cu. ft. gas.

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Write for Bulletin No. 17 which gives other interesting details about Jensen Pumping Units . . .

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COFFEYVILLE **KANSAS, U. S. A.**

New Field Opened

WHEELER RIDGE TEST HAS SMALL BUT PROFITABLE FLOW

WEEKLY STAFF REPORT

Los Angeles. — Reserve Oil & Gas Company is credited with the discovery of a new oil field in Tejon Ranch 1, Section 2-10n-19w, Wheeler Ridge district, 25 miles south of Bakersfield, Kern County.

Total depth of Tejon Ranch 1 was 3708 feet but has been plugged back to 2695 feet. Water shut-off is with 6⅝-inch casing cemented at 2664 feet. Initial production was 58 barrels per day of 17.5 gravity oil, cutting a small amount of sand, but in view of the depth, ease of drilling, and slight casing cost, this is considered a very profitable well.

Reserve Oil & Gas Company has approximately 4000 acres under lease in this block and, taking into consideration the information uncovered in the first well, at least half of the acreage is believed to be higher on structure than the first test.

Devil's Den Failure

With the exception of an exceedingly small area, where Richfield Oil Company succeeded in obtaining 50 barrels per day from Alferitz 2, all efforts to develop production in the Devil's Den district of Kern County have failed consistently. The last failure, Amerada Petroleum Corporation's Beer 3, Section 17-26s-19e, located 25 miles southerly from the southernmost portion of Kettleman Hills North Dome, was abandoned last week at 3861 feet without having encountered oil or gas showings of any nature.

The Devil's Den structure is well defined on the surface and numerous tests have been drilled and repeated production tests made, but no sands capable of sustained oil flow have been uncovered.

Big McKittrick Oil Company has written finis to its deep test of the Greenfield district, Section 7-31-28, located about 10 miles south of Bakersfield. This well originally was known as Sea Cliff Oil Company's Houghton 1, and was taken over by present operators immediately after spudding and the lease name changed to Houghton 1. It was drilled to 6767 feet without penetrating any showings worth mentioning, and hole was open from 685 feet, where nine-inch casing was set, to bottom. Operators considered the drilling hazard too great to continue farther with this amount of open hole, and, in view of poor results obtained so far, did not consider the project worth a string of casing.

KERNELL GAS AREA

Tulare County promises production of magnitude

Los Angeles.—Prospects for a field of some magnitude in the Kernell gas district, located in the extreme southwest corner of Tulare County, were materially increased last week with results shown when Standard Oil Company ran a formation tester in Rideout 1, Section 34-24s-23e. Total depth is 2451 feet and the tester was set at 2388 feet. On a 12-minute test the well showed 10,800,000 cubic feet per day rate of gas. Operators are preparing to run casing and complete the well in an orthodox manner.

Standard Oil Company's Widgeon 1, Section 1-25s-23e, discovery well of this gas field, was completed three weeks ago for an initial production of 6,000,000 cubic feet of gas per day from 3256 feet.

Two more good producers were added to the Semitropic gas field last week, bringing the total number of producers up to seven.

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CALIFORNIA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
EDISON—		
General, Knapp 1	80	1678
FRUITVALE—		
Western Gulf, Scott 1	300	3924
MOUNTAIN VIEW—		
Mohawk Pet. Co.'s Clendenen 4	3360	5930
ROUND MOUNTAIN—		
Honolulu Oil Corp., No. 23	900	1990
SEMITROPIC—		
Milham Explor. Co., Continental 22-15	¶21	3152
VEDDER—		
Modoc Pet. Corp., Vedder 3	220	1534
DOMINGUEZ—		
Shell, Reyes 72	1250	4551
Union, Hellman 38	140	4405
VENICE—		
Petrol Corp., Ben 2	2000	6629
Royalties Service Corp., Del Rey 2	1500	6630
LOS ANGELES COUNTY—		
West American Oil Co., Bandini 1.	*	4675
KERN COUNTY—		
Amerada, Beer 3	*	3861
Big McKittrick Oil Co., Houghton 1	*	6767

*Failures; †Junked; ¶Million cu. ft. gas.

MONTEBELLO EAST

Extension active area; Ventura wildcats quit

Los Angeles.—The easterly extension of the old Montebello field continues to be one of the "hot spots" of California oil field development. The Texas Company's City of Whittier 1 is drilling at 4826 feet in conglomerate, and location has been made for a second well. The new project, Baldwin 13, will be a direct offset to the northwest to the discovery well of this area, Universal Consolidated Oil Company's "N" 2, and will be located about 350 feet distant from that well.

Universal Consolidated Oil Company is about ready to spud Estrado 1, second test of the new extension, and also has foundations in for a third well, Farmer 1.

Wilshire Oil Company's Montebello 1 is now bottomed at 3265 feet in hard shale and is coring for the top of the Repetto formation.

Woodward Oil Company's Lapworth 1, southeasterly outpost project located about 1½ miles from the discovery well, was drilled to 3244 feet but has been plugged back to 3167 feet and now has 8⅝-inch casing cemented at 3090 feet, for a test of oil sands penetrated from 3065 feet to 3167 feet. This well was considered a wildcat when started but now appears to be one of the highest wells, structurally, in the area.

Ventura County

Hopes for obtaining deep commercial production in Ventura County suffered another serious setback last week when The Texas Company suspending drilling operations in Shiells 128, deep test of the old, shallow Shields Canyon field. This well, in Section 4-3n-19w, in an area where shallow production has been obtained for many years from depths ranging between 500 and 3000 feet, was carried down to 7423 feet. Almost 3000 feet of Cretaceous shales were penetrated and hole was bottomed in that formation when drilling was suspended.

Operators plan to plug back to approximately 5250 feet for a test of the basal member of the Sespe formation. If unsuccessful in a production test from this zone, the well no doubt will be plugged back to the sands at about 3550, from which a formation tester showed a recovery of 2000 barrels per day rate before deepening.

The production test on Union Oil Company's Dryden 1, Section 12-3n-20w, failed to show anything of commercial importance and will be carried deeper. This well is located immediately to the south of the old, shallow Bardsdale field, Ventura County, 20 miles east of the Ventura Avenue field, and most geologists concede an excellent chance for deeper production.

The test was made with bottom at 3336 feet, with 11¾-inch casing cemented at 3223 feet, and 144 feet of 6⅝-inch liner, including 115 feet of perforations, was landed at 3336 feet. Following failure of the production test, this liner was pulled and the hole is being deepened below 3450 feet.

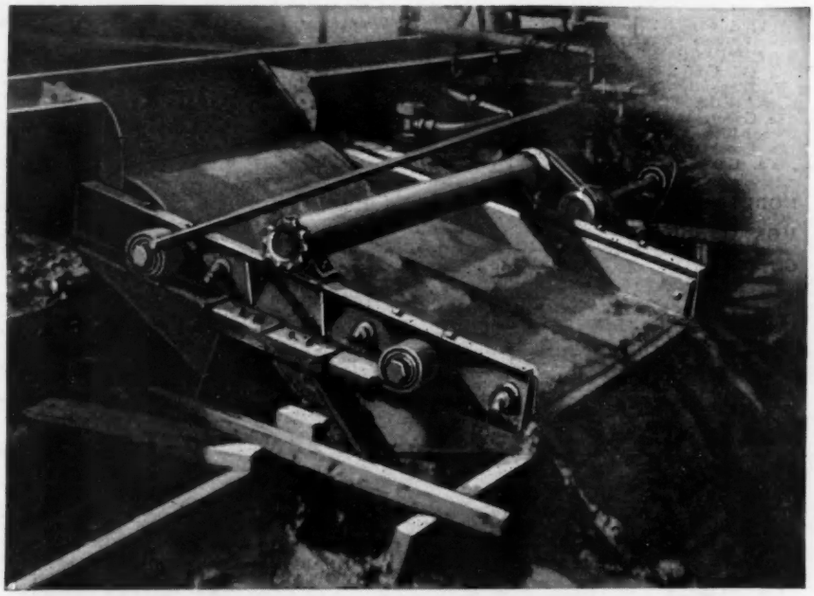
West American Oil Company's sudden announcement last week that Bandini 1, wildcat test in Section 17-2s-12w, located about eight miles southeast of Los Angeles would be abandoned, caused considerable surprise. This well was carried to only 4675 feet, bottomed in sandy shale with no showings. However, it was correlating low, structurally. Western Gulf Oil Company's Vail 1, located in the next section to the east, is being drilled and cored ahead below 5900 feet, and, with the exception of a few streaks of oil sand at about 5069 feet and a slight amount of gas at 5775 feet, showings encountered have been relatively unimportant.

Another interesting wildcat test was listed for abandonment when Deep Zone Oil Company's U. S. Prospecting Permit 1, Section 29-28s-27e, was suspended a few days ago.

This project has a considerable body of poor oil sand from 2820 feet to bottom at 3190 feet. Saturation was too poor and the proximity of water too great, so operators decided to abondon. Location of this test is two miles west of the old Kern Front field and 10 miles northwest of Bakersfield, and at the time the oil sands were first penetrated it was thought that a new oil field had been discovered.

Los Angeles. — Barnsdall Oil Company has placed on record leases on approximately 4000 acres in the Senton School District, 35 miles northwest of Los Angeles, in Sections 26, 27, 28, 33, 34, 35, and 36, of Township 4 North,

The LINK-BELT ROTARY MUD SCREEN



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Range 17 West, all of which was taken from the Newhall Land & Farming Company. No indication has been given that a well is contemplated for the immediate future, but the leases carry a provision for drilling within one year.

EASTERN FIELDS

WEEKLY STAFF REPORT

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
WEST VIRGINIA		
BOONE COUNTY—		
Owens Ill. Glass Co., Vanderline 1	¶	2105
Wheeler Hrs. 2	¶	2227
CALHOUN COUNTY—		
E. P. Cottrill, Masey 1	¶	1308
Starcher & Richard, Kight 1	¶	2100
CABELL COUNTY—		
Edward Owens, Bales & Gardner 1	¶	3433
ROANE COUNTY—		
D. W. Law & Co., Lyons 1	¶	1616
RITCHIE COUNTY—		
Beech Oil Co., Newbrough 2	¶	....
L. N. Rinehart, McGregor 1	¶	....
KANAWHA COUNTY—		
G. L. Cabot, Inc., Edgewood 1	*	....
Owens-Illinois 1	*	....
C. O. Crockett, Owens-Illinois 10	¶	2160
W. Va. Gas Co., Dingess 38	*	3236
SOUTHEASTERN OHIO		
NOBLE COUNTY—		
E. C. Merry & Co., Nohman 7	*	165
MONROE COUNTY—		
Eclipse Oil & Gas Co., Besse McGary 3	1	858
Penn-Ohio Oil Co., Peter Rushbeck 7	*	2080
Gordon-Green & Co., Eliza Baker 4	¶	1455
WASHINGTON COUNTY—		
Harry Binegar, L. C. Moore 6	¶	1967
Brown Bros., Walter Brown Hrs. 7	5	1330
Chesmar Oil & Gas Co., W. Greenwalt 2	¶	1192
D. T. Orndorf, Phillip Roe Jr. 6	*	....
Schneider & Co., Covey 2	3	....
C. D. Mosher & Co., Lightner 1	1	....
CENTRAL OHIO		
MEDINA COUNTY—		
Preston Oil Co., Grigsby 17	*	428
R. G. Steingass, Obermiller 8	¶	2797
L. A. Severcool, Lake 19	*	265
Lake 20	25	360
Lake 21	20	304
Edson & Son, Miller 49	20	277
Miller 50	18	492
L. T. McGrath, Spitzer 2	*	....
Spitzer 3	*	....
Spitzer 4	*	....
Edson & Son, Wideman 28	*	517
STARK COUNTY—		
East O. G. Co., John C. Mayer 1	¶	4532
RICHLAND COUNTY—		
J. B. Reed, McCorkie 1	*	573
TUSCARAWAS COUNTY—		
James Upham, Uhlers 1	¶	4818
KNOX COUNTY—		
S. Brown & Co., Vanwinkle 1	3	....
Preston Oil Co., Phillips 1	18	....
GUERNSEY COUNTY—		
Barnesville Dev. Co., Jackman 1	*	1385
George Jewell & Co., Saltzgaber 1	*	1706
E. C. Quillan, Quillan 5	20	3458
ATHENS COUNTY—		
Ohio F. G. Co., Keirns 1	¶	1623
Black Diamond 7	¶	971
A. D. Townsend, Barney 2	¶	626
MEIGS COUNTY—		
Turney & Co., Powell 1	¶	1926
O. D. Jones, Smith 1	¶	1978
Lafe McKnight, Haley 1	¶	772
LIMA FIELD		
HARDIN COUNTY—		
Waltermier & Co., Sharf 2	¶	1342
ALLEN COUNTY—		
L. J. Pease, Tr., Leedy 6	30	....
OTTAWA COUNTY—		
C. H. Graves, Peelie Island 1	200	....
WOOD COUNTY—		
L. Hillie, Linkey 4	*	1331
KENTUCKY		
OHIO COUNTY—		
Snowden-McSweeney Co., O'Dell 19	80	....
Midkiff 1	5	....
Peckenpaugh 19	75	....
Roberts 8	¶	....
C. C. Brener, Coppage 5	20	....
Cumberland Pet. Co., Richards 9	15	....
Richards 25	50	....
Mecca Oil Co., Smith Hrs. 11	50	....
Petroleum Co., E. Bowman 2	*	....
William Percevial, Clark 1	100	....
HANCOCK COUNTY—		
J. B. Mayer, Matthews 19	150	....
Matthews 20	100	....

*Failures; †Junked; ¶Million cu. ft. gas.

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CLARE COUNTY GAS

To be marketed through line to be constructed

WEEKLY STAFF REPORT

Mt. Pleasant, Mich.—Gas Corporation of Michigan has contracted to purchase available natural gas in the McKay-Mercier gas field of Clare County and will start construction of 13 miles of new four-inch line next month.

The McKay-Mercier field was discovered in 1929 with a 3,800,000 cubic foot well drilled in Section 6 of Grant township, Clare County, producing from 1410 feet.

Seven commercial gas wells with an aggregate initial daily flow of 31,000,000 cubic feet have been completed. There has been no drilling for the past two years, with all production capped from date of completion.

The productive area covers about 900 acres with reserves estimated up to 1,500,000,000 cubic feet.

Gas Corporation of Michigan services Mt. Pleasant, Rosebush and Clare with a market of about 1½ to two million feet per day. Up to the present time production has been obtained in the Vernon field of Isabella County.

Mt. Pleasant, Mich.—Completion of T. F. Caldwell's Robins 1, 10n-5w-3, Montcalm County, for 2460 barrels daily from 3199 feet in lime was the most important Michigan completion of the week. The test is located a mile north and a half-mile west of the Crystal discovery well.

MICHIGAN

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MIDLAND CONUTY—		
Theodore Oil Co., Campbell 8, 13n-1w, ne se nw-17	130	3405
Pure Oil Co., Root C-5, 13n-1w, se nw nw-20	1800	3412
ISABELLA COUNTY—		
Jackson-Myer Synd., Hughes 2, 15n-3w, nw se ne-19	¶3	1245
Mich. G&O Co., Hanson 1, 13n-4w, se se se-33	*	lcn.
MONTCALM COUNTY—		
J. W. Leonard, West 3, 10n-5w, nw ne nw-11	30	3208
Eastern Gulf, Barger 1, 10n-5w, sw sw se-2	20	3197
J. E. Evans, Smith 1, 10n-5w, ne ne nw-10	200	3204
T. F. Caldwell, Robins 1, 10n-5w, ne ne ne-3	2435	3199
Rowmor Oil Co., Barger 1, 10n-5w, nw nw ne-10	50	3209
Wing Brothers, Crystal School 1, 10n-5w, sw sw sw sw-1	¶1	1010
MECOSTA COUNTY—		
Mecosta Dev., Totten 1, 14n-9w, nw nw-11	¶1	1310
GLADWIN COUNTY—		
Beaverton Oil Co., Ross 1, 17n-1w, se sw ne-7	*	3945
SAGINAW COUNTY—		
Smith Pet. Co., Totten 2, 10n-6e, ne ne sw-20	25	1460
Soule 2, 10n-6e, ne se se-20	20	1450

*Failures; †Junked; ¶Million cu. ft. gas.

THE OIL WEEKLY REPORT ON IMPORTANT

Wildcat Tests

ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

* —*dry hole abandoned well.*	owdd —*old well drilling deeper.*
‡ —*salt water (completions.)*	owpb —*old well plugging back.*
† —*junked and abandoned.*	pb —*plugged back or plugging back.*
¶ —*million feet of gas.*	r —*reaming.*
abd —*abandoned.*	rog —*rig on the ground.*
bbls —*barrels.*	rur —*rigging up rotary tools.*
br —*building rig.*	rust —*rigging up standard tools.*
b.s. —*basic sediment.*	sd —*shut down.*
csg —*casing.*	sdtr —*sidetracking.*
co —*cleaning out.*	sg —*show gas.*
dd —*drilling deeper.*	si —*shut in.*
dk —*derrick.*	so —*show oil.*
dr —*drilling.*	so & g —*show oil and gas.*
fsg —*fishing.*	spd —*spudding.*
ft —*feet.*	sr —*straight reaming.*
hfw —*hole full of water.*	sw —*salt water.*
in —*inches.*	td —*total depth.*
lcn —*location.*	ur —*underreaming.*
m —*milling.*	wih —*water in the hole.*
mim —*moving in materials.*	wo —*workover.*
mit —*moving in tools.*	wocs —*waiting on cement to set.*
mot —*milling on tools.*	wosr —*waiting on standard rig.*
n, s, e, w, —*north, south, east, west.*	
oih —*oil in hole.*	

ALABAMA

BALDWIN COUNTY — Mrs. Mamie McCurry et al's Southern Kraft 1, nw ne sw 28-2s-4e, 12½ in csg 186 ft, dr 802 ft sand.

HOUSTON COUNTY — Rice O&G Co.'s Oakley Est. 1, sw ne sw 9-3n-29e, co, td 2772 ft rock.

LAMAR COUNTY — De Soto O&G Co.'s Gardner 1, nw nw 22-15s-16w, dr 4450 ft, gray lime.

ARKANSAS

ARKANSAS COUNTY — Grand Prairie Realty Co.'s Fischer 2, ne nw nw 6-6s-4w, sd for surf csg 120 ft.

ASHLEY COUNTY—Glen E. McFadin et al's Bovine Farms 1, ne ne 1-18-8w, sd 2798 ft.

CALHOUN COUNTY—The Hunter Co.'s Stout Lbr. Co. 1, nw ne 33-16-13, rur.

COLUMBIA COUNTY — J. G. Cubage's Rhea 1, sw se se 12-17-22, rur. Southern States Gas Co.'s Pine Woods Lbr. Co. 1, sw ne nw 10-20-22, sd 960 ft.

HEMPSTEAD COUNTY—F. W. Martin et al's Lafferty 2, se nw 17-14-24, dk.

LA FAYETTE COUNTY—W. H. Harvey's R. F. Allen 1, ne se sw 13-19-25, dk. S. H. Riggs et al's Du Bose 1, se sw nw 35-15-24, sd for formation tester, td 2817 ft. Transportation Pet. Co.'s Cochran Est. 1, ne se 25-19-25, dk. Red River Lbr. Co. 1, sw sw 26-19-25, elev 250 ft, top Nacatosh 1804 ft, top Ozan 2740 ft, dr 4178 ft.

MILLER COUNTY—C. J. Hodges et al's Commercial Nat. Bank 1, sw ne se 30-17-28, dk. King Oil Corp.'s E. G. Anderson 1, nw sw ne 16-14-27, sd 2570 ft. Lee Timberlake's Frost Lbr. Co. 2, sw sw se 27-15-26, dr 400 ft.

MONROE COUNTY — Beaver Pet. Co.'s Stinson 1, sw se sw 27-4n-2w, sd for csg 190 ft.

OUACHITA COUNTY—T. J. Gaughan et al's M. Bragg 4, nw ne ne 26-13-18, spd dr 750 ft.

UNION COUNTY—Gulf Ref. Co.'s Werner Lbr. Co. 49, sw nw sw 5-16-16, elev 128.5 ft, 10 in csg 2293 ft, 7-in OD csg 6224 ft, top Permian salt 6665 ft, dr 7486 ft, Permian salt. H. L. Hunt, Inc.'s E. F. Gregory 15, se se 10-17-14, elev 180.4 ft, 7 in OD csg 5834 ft, base red beds 5937 ft, top Permian salt 6816 ft, temp abn, td 6911 ft Permian salt. Mrs. R. K. Jones' J. Davis 1, nw nw 28-16-14, dr 3258 ft. Ohio Oil Co.'s Sam Oliver 2, nw sw sw 7-17-13, lcn. E. O. Olds' Telford 1, nw nw 35-17-15, pumping intermittently wo gauge, td 2211 ft.

CALIFORNIA

ARVIN—General's Mattson 1, 1-32-29, dr sand 6008 ft.

BELRIDGE—Continental's Maylan 1, 7-28-20, sd 5304 ft.

BUENA VISTA LAKE—Shell's B. V. A. 1, 9-32-25, coring silty claystone 7386 ft.

DEVIL'S DEN—Amerada's Beer 3, 17-26s-19, abn 3861 ft.

GRAPEVINE—Silver Gate Co.'s Tejon 1, 7-10-19, sd 1410 ft.

GREENFIELD—Big McKittrick Oil Co.'s Houghton 1, 7-31-28, abn 6767 ft.

KERNELL—Standard's Rideout 1, 34-24-23, td 2460 ft, wocs 8⅝ in 2408 ft; Widgeon 2, 12-25-23, td 4233 ft, tested muddy salt water 4124 ft.

LOST HILLS—Standard's United 1, 2-26-20, dr hard gray sand 4825 ft.

SOUTH DOME—Continental's Gatchell 28-7, 7-25-20, td 6903 ft, rigging heavier equip.

WHEELER RIDGE—Reserve O&G Co.'s Tejon 3, 12-10-19, dr gray sand 878 ft.

FRESNO COUNTY — Taft Well Drilling Co.'s Kreyenhagen 1, 33-22-16, dr hard gray sand 3093 ft.

HUMBOLDT COUNTY—Texas Co.'s Eureka 1, 1-3-2, td 6133 ft, swabbed little gas and condensate and 200 bbls water, pulled liner, plug 5850 ft, run liner to 4200 ft, swabbed again, sanded up and sd.

SACRAMENTO COUNTY—Great American Pet. Co.'s Howard 1, 25-2-8, dr hard sand 3016 ft.

SAN JOAQUIN COUNTY—Amerada's F. D. L. 1, 15-2-5, td 5875 ft, wocs 13⅜ in 5680 ft.

TEHAMA COUNTY — Northern Counties Pet. Co.'s Ewers-Mooney 1, 25-24-3, dr sand and shale 4578 ft.

MONTEREY COUNTY—Shell's Brabch 1, 34-24-10, dr gray and black shale 3606 ft.

SANTA BARBARA COUNTY

GOLETA—Shell's Hollister 1, 10-4-29, dr sand 1203 ft.

VENTURA COUNTY

BARDSDALE—Union Oil Co.'s Dryden 1, 12-3-20, td 3441 ft, deepening.

CONEJO—International Oil Dev.'s Powell 1, 33-2-20, td 3060 ft, to recement 10-in 1600 ft.

FILLMORE—Texas Co.'s Unit Plan 2-1, 29-4-19, rig.

HOPPER CANYON—Oil Ridge Oil Co.'s Moran 3, 1-4-19, td 1660 ft, trying to pump.

LAS POSAS—Las Posas Pet. Co.'s Mahan 1, 27-3-20, td 8120 ft, wocs 8¼ in 7022 ft.

OXNARD—General's McGrath 1, (?)-1-22, dr 735 ft.

SHIELLS CANYON—Henry R. Dabney's McGuire 1, 2-3-19, rig. Texas Co.'s Shiells 128, 4-3-19, td 7423 ft, to plug to 5250 ft for test.

SIMI—Paloma Oil Co.'s Paloma-Marr 1, 12-2-18, dr hard sand 2315 ft.

SO. MOUNTAIN—Calco Pet. Corp.'s No. 2, 17-3-20, dr shale, streaks os 2350 ft.

SOUTHERN CALIFORNIA

ARTESIA—Vanco Dev. Co.'s Millard 1, 25-3-12, dr shale sg 5496 ft.

BANDINI—West American Oil Co.'s Bandini 1, 17-2-12, abn 4675 ft. Western Gulf's Vail 1, 16-2-12, coring sand and shale 5890 ft.

DEL REY HILLS—Winoco P&R Co.'s Mesmer 1, 26-2-15, foundations.

EL SEGUNDO—Republic Pet. Co.'s No. 1, 18-3-14, dr hard shale 5732 ft.

NEWPORT—Wilshire Oil Co.'s Newport 1, 29-6-10, dr gray sand and shale 1526 ft.

PICO—Frontier Oil Co.'s No. 1, 12-2-12, dr hard sand and shale 3760 ft.

RICHFIELD—C. H. Shannon's Day 1, 21-3-9, td 5777 ft, plug 2257 ft, co to test.

SAUGUS — International Oil Developers' Powell 1, 34-5-16, td 4339 ft, made 850,000 cu ft gas, shut in; Powell 2, 34-5-16, laying water line.

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Pure... clear drinking water
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KEEP PURE DRINKING WATER ALWAYS HANDY

COLORADO

ARCHULETA COUNTY — William E. Hughes Estate's Fee 1, sw 24-33n-28, spd.

ELBERT COUNTY—Ramsey Pet. Corp.'s Union Pacific 1, c 13-8s-57, lcn.

GRAND COUNTY — Colo. Oil Ref. Co.'s Linke 1, ne sw sw 13-1n-77w, dr 2000 ft.

MORGAN COUNTY—Swisher et al's Lunt 1, sw sw sw 3-4n-60w, mim.

PARK COUNTY — South Park Oil Co.'s State 1, se se sw 16-11n-75w, dr 1486 ft.

PROWERS COUNTY—Trojan O&G Co.'s Lotus 1, nw ne ne, 15-23s-46w, dr cement 5129 ft, td 5227 ft.

FLORIDA

LAKE COUNTY—Oil Dev. Co. of Fla.'s Gulf Expl. Co. 1, se se 17-24s-25e, 16-in csg 138 ft, 12-in csg 490 ft, base anhydrite and gypsum 1600 ft, chalk 1745-1860 ft, arr test so 1875-1915 ft lime.

PINELLAS COUNTY—Dr. Edward A. Hill, Fee not given, ne ne 2-27s-16e, mim.

POLK COUNTY—Edward A. Hill et al, Fee not given, nw nw 32-25s-25e, dk.

KANSAS

BARBER COUNTY—Laria et al's Whelan 2, cse nw 32-31s-11w, td 4550 ft, running 5-in csg. L. H. Wentz's Skinner 1, cnw ne 29-31s-14w, td 3420 ft, rng 8-in csg. Southern Drilg. et al's Davis 1, sw se ne 13-34s-15w, td 4664 ft, rust.

BARTON COUNTY—Pryor & Lockhart's Herrington 1, ne ne nw 6-16s-12w, water 3240-50 ft, 6-in csg 3157 ft, siliceous ls 3350 ft, so 3346-54 ft, hfw 3387 ft, td sd. Lario and McCoy's Dolechek 1, ne nw ne 13-16s-12w, conglomerate 3295 ft, Siliceous ls 3320 ft, 6-in csg 3320 ft, so and w at 3320-25 ft, 200 ft, wih 3328 ft, td sd. C. L. Price et al's Ehrlich 1, nw nw se 10-16s-13w, sd 1984 ft. Lario O&G Co. et al's Nuss 1, nw sw sw 11-16s-14w, treated 2000 gals, testing. Suppes & Witt's Hays 1, nw nw nw 7-16s-15w, dr 2300 ft. Torry & Feaster et al's Feist 1, ne ne se 29-18s-11w, spd. Palmer Oil's Morris 1, se nw ne 6-19s-15w, 20-in csg 202 ft, 15½-in csg 1420 ft, wocs.

BUTLER COUNTY—Western Kansas P. & R. Co.'s King and Marshall 1, nw nw sw 11-28s-6e, dr 600 ft. Hay and Cameron's Johnson 1, nw nw se 16-26s-6e, top Viola 3200 ft, so 3202 ft, water 3204 ft, sand 3209 ft, abd 3218 ft. Polhamuse et al's Semisch 2, cs½ ne ne 5-28s-7e, dr 1600 ft. Sanford et al's Cron 1, se se se 1-28s-4e, sd 2271 ft.

CHAUTAUQUA COUNTY—Central Oil Co.'s Crews 1, ne ne sw 8-32s-12e, abd hfw 1775 ft.

COWLEY COUNTY—Wakefield's Tharp 1, se se ne 10-32s-3e, dr 1395 ft.

ELLIS COUNTY—Lewis Roark et al's Bemis 1, se se se 16-11s-17w, mim. Ellis Oil Co.'s Freis 1, se se nw 10-12s-20w, cellar. Joe Aylward's Dreiling 1, se se se 3-14s-16w, td 2655 ft, ur 8-in csg. Helmerich and Payne et al's Kuhn 1, nw sw ne anhydrite 1510 ft, dr 2655 ft. Palmer et al's Ruder 1, se ne nw 17-15s-18w, dr 2675 ft. Stanolind's Penny-Wann 1, nw sw se 12-15s-20w, Oswald ls 3298 ft, so 3300 ft, cored 3320-36 ft, td recov 10 ft ls saturated 3323-27 ft, testing.

ELLSWORTH COUNTY—Western Exploration's Wilkins 1, nw sw nw 9-17s-9w, conglomerate siliceous 3350 ft, hfw 3355 ft, to abd.

GRAHAM COUNTY—Helmerich & Payne et al's Stites 1, csw sw 8-10s-22w, dr 3440 ft.

HARPER COUNTY—Kessler & Their et al's Walfje 1, sw sw ne 17-33s-6w, 15½-in csg 40 ft, dr 1670 ft.

HARVEY COUNTY—Winkler & Koch et al's Mueller 1, se sw nw 15-23s-2w, 8-in csg 2632 ft, dr 3045 ft. H. H. & S. Oil Co.'s Frizzle 1, ne ne se 31-23s-2w, dr 222 ft. Goering Bros. et al's Brainard 1, ne ne sw 3-23s-2w, sd 1320 ft. Hartman & Blair's Redinger 1, nw nw nw 15-24s-3w, 12½-in csg 628 ft, td wocs.

KINGMAN COUNTY—Kingman's Wetherall 1, ne ne sw 20-28s-10w, sd 3793 ft.

McPHERSON COUNTY—Carey et al's Husband 1, se se nw 6-19s-3w, rig. J. M. Washabaugh et al's Berg 1-A, sw sw ne 15-20s-3w, rog. Hollow, Toews, Hinkle's Aschman 1, nw nw se 8-21s-4w, 15½-in csg 245 ft, dr 480 ft.

RENO COUNTY—Allison-Fitzwilliams et al's Dukelow 1, ne ne ne 11-22s-6w, 20-in csg 72 ft, td, wocs. Anderson-Kerr's Davies 1, ne ne ne 28-23s-7w, rur. Haynes Bros. et al's Mueller 1, se se nw 30-24s-4w, 7-in csg 3365 ft, td 3405 ft, wocs. Foraker et al's Hiett 1, se sw ne 34-24s-4w, sd 1330 ft. Gypsy's Tonn 1, sw nw se 16-25s-4w, hfw 4035-37 ft, sd 4126 ft.

RICE COUNTY—Vickers Pet. et al's Couldner 1, se ne nw 16-18s-9w, pump 632 bbls oil 17 hrs on potential gauge. Detrick et al's Conner 1, cne ne 28-19s-7w, mim. Anderson-Kerr's Wernet 1, nw nw nw 24-20s-6w, lcn. Detrick et al's Monroe 1, cne ne 9-20s-7w, spd. Anderson-Kerr et al's Lackey 1, ne se nw 13-21s-6w, chat 3465 ft, cored 3494-3513 ft, abd 3564 ft. C. B. Teague et al's Hauschild 1, ne ne nw 15-21s-7w, cellar and pits.

ROOKS COUNTY—Gillespie & Son's Low 1, ne ne nw 12-6s-18w, lcn. El Dorado Ref. et al's Marshall 1, cse se 8-7s-17w, ru. I. W. Murfin et al's Wasthusin, ne ne se 19-9s-16w, rig. Smith-Ash's Nelson 1, nw nw ne 27-10s-16w, 12½-in csg 1287 ft, dr 1360 ft. Tree Oil and Findiess' Johnson 1, sw sw se 26-10s-19w, dr 2365 ft.

RUSH COUNTY—Lario, Madison & Hewitt's Gillig 1, ne se nw 24-17s-17w, dr 1128 ft. Twin Drlg. et al's Appl 1, sw sw ne 29-17s-17w, 12½-in csg 1158 ft, dr 1260 ft. Boyle & Grossman et al's Yost 1, csw sw 23-17s-18w, water 3500-05 and 3525-30 ft, 6-in csg 3529 ft, dr 3530 ft. Boyle & Grossman's Wilson 1, ne ne ne 33-17s-19w, cellar. Ramsey Pet. et al's Darkes 1, sw sw nw 5-17s-20w, dr 3450 ft. Flynn et al's Hartman 1, sw se nw 4-18s-16w, rig. Gypsy's Kraisinger 1, se ne se 23-18s-17w, mim.

RUSSELL COUNTY—Pryor and Lockhart's Spicer 1, ne ne se 21-11s-15w, td 2530 ft, ur 8-in csg. Hartman, Blair et al's Claussen 1, se ne sw 34-12s-14w, rog. Winkler Koch et al's Herman 1, se se nw 27-12s-15w, Oswald ls 3030 ft, td, ur 6-in csg. Roth and Farrott's Shaffer 1, nw nw ne 31-13s-12w, spd and sd. Tom Palmer's Machin 1, sw sw se 9-13s-14w, cellar. McMorrow et al's Atherton 1, nw nw ne 30-13s-14w, 8-in csg 2542 ft, Topeka ls 2735 ft, sd 2790 ft, td. Stearns & Streeter's Dreling 1, sw sw sw 8-13s-15w, building rig. Hartman & Blair's Mills 1, se se sw 27-13s-15w, building rig. Hartman & Blair's Rexroot 1, ne nw nw 31-14s-14w, sd 3080 ft. Buffalo Oil Company's Kunz 1, ne ne sw 19-14s-15w, mim. Murfin et al's Gorham Estate 1, ne ne se 29-14s-15w, cellar. Wakefield & Armer's Hall 1, ne se sw 36-14s-15w, pump 105 bbls oil 6 hrs, sd. J. Brouk & R. D. Bailey's Kluesner 1, nw nw se 34-15s-12w, fighting cave 2100 ft. Coraleana's Flegler 1, se se se 11-15s-14w, ru. Nassau Oil Corp.'s Karst 1, nw sw ne 27-15s-14w, ru.

SCOTT COUNTY—Atlantic's Mark "A" 1, cse se 28-20s-33w, water 5600-10 ft, sd 5630 ft.

SEDGWICK COUNTY—Dickey et al's Chase 1, se se se 11-27s-2e, spd. Derby et al's Bartholomew 1, sw sw nw 8-27s-4w, dr 2822 ft. Allison & Fitzwilliams et al's Struthers 1, ne sw sw 34-28s-2w, dr by tools at 3095 ft.

STAFFORD COUNTY—Empire's Grove 1, ne ne nw 5-22s-11w, dr 2215 ft. C. B. Davis et al's Riley 1, se se se 19-22s-11w, td 3606 ft, pumped 180 bbls oil and 14 bbls water 24 hrs, will acidize. Helmerich, Payne & Chas. Newbold's Geisler 1, nw nw se 28-22s-12w, td 3673

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ft, fighting cave. Rosespring Drlg. Co.'s Lottland 1, nw nw sw 2-25s-14w, rog.

SUMNER COUNTY—Allison & Fitzwilliams et al's Hitchcock 1-B, se se nw 16-30s-1w, 8-in csg 2777 ft, td, wocs. Winkler & Koch et al's Belsley 1, sw sw nw 2-32s-2w, spd.

TREGO COUNTY — Central Commercial's Wagg 1, nw nw se 17-13s-21w, co 1600 ft. Hansa & Lauck's Lang 1, se se nw, dr by at 2800 ft. Vickers et al's Secor 1, nw nw nw 25-15s-24w, rig.

WOODSON COUNTY—Connell & Marshall's Klick 1, sw nw sw 20-25s-14e, dr 1080 ft.

LOUISIANA GULF COAST

ACADIA PARISH — Continental's Theogen Ortigo 1, 6 mi nw of Iota, sec 28-7s-2w, dr shale 7669 ft. Humble's Rice Milling Co. 1, s of Crowley, sec 27-10s-2e, woc 5444 ft.

CALCASIEU PARISH—Nichols McCaleb's Gray 1, 9 mi nw of Starks field, sec 22-8s-12w, dr gumbo 1430 ft. Wheeler Oil Co.'s School Land 1, s of Iowa field, sec 16-9s-7w, dr shale 3924 ft.

CAMERON PARISH — Magnolia's Broussard 1, sec 13-12s-9w, td 7890 ft, drill stem stuck at 2340 ft.

EAST BATON ROUGE PARISH—Superior's Duplantier Community 1, s of Baton Rouge, sec 65-7s-1w, washing over stuck drill stem at 3887 ft, td 7747 ft.

IBERIA PARISH—Meade Oil Co.'s De Rouen 1, ne of Jefferson Lake, sec 38-12s-5e, sd 200 ft. Texas Co.'s State Lake Fausse Point 1, s flank of Dome, sec 35-11s-8e, sdtr 2495 ft, td 5128 ft.

JEFFERSON DAVIS PARISH—H. M. Naylor's Boudreaux-Johnson 1, sec 39-10s-3w, sd 800 ft.

ST. BERNARD PARISH—Emerald Pet. Co.'s Shell Beach Properties 1, s edge of Bayou Louis, sec 31-13s-15e, dr shale 7365 ft.

ST. MARTIN PARISH—Texas Co.'s St. Martin Land 7, Henderson prospect, sec 9-8s-7e, dr shale 6175 ft.

VERMILION PARISH — Delcambre & Sheldon's Delcambre 1, Jefferson Island, sec 63-12s-5e, dr sand and gravel 720 ft.

NORTH LOUISIANA

BOSSIER PARISH — Bossier O&G Co.'s Sherrell 3, se se 13-19n-12w, 10-in csg 125 ft, dr 825 ft. W. A. Kirklin, Tr.'s Garrett & McKellar 1, se nw nw 3-21n-13w, sd 2397 ft. W. E. Neill et al's Curtis 1, se se 19-17n-12w, spd. Plain Dealing Synd.'s Dodson 1, nw sw se 25-23n-13w, dk. Producers O&G Co.'s E. C. Edwards 1, se sw 27-18n-11w, rur. Richplain Oil Co.'s Gaines 1, nw nw 22-22n-13w, cored 3½ ft sand so, 6-in csg 2835, top cap rock, tested sw and so, sd 2842 ft. A. H. Richardson's Nattin 1, ne sw 15-22n-14w, rur. L. R. Skidmore's Davis 1, se se 12-18n-13w, dr 2090 ft. The Leonard Co.'s Pearson 1, 22-21n-14w, fsg 3300 ft.

CADDO PARISH—Haynes Oil Co.'s Tyson 1, nw se 24-23n-16w, rur. F. D. Hyde et al's Thigpen-Herold 1, nw nw se 5-15n-15w, dr 1055 ft. A. D. King, Tr.'s Roach 1, 1-14n-16w, swabbing sw and so after using acid, td 2712 ft, chalk. United Gas Pub. Serv. Co.'s D. F. Barr 1, 29-23n-16w, elev 283.4 ft, cemtd 7-in csg 5612 ft, td 5617 ft. Young 1, se se 21-13n-16w, elev 209.13 ft, tested est 20-40 mil ft gas and est 5000 bbls 41.6 grav oil, si, connecting tanks and separator, td 6048 ft, sandy oolitic lime.

CALDWELL PARISH—Critchett & Wood's La. Cent. Lbr. Co. 1, se nw ne 18-11n-3e, wocs 6⅝-in csg 1704 ft, td 1716 ft. G. C. Davis et al's La. Cent. Lbr. Co. 1, sw sw 14-11n-3e, sr td 1850 ft. G. W. Zeigen et al's La. Cent. Lbr. Co. 1, nw sw sw 25-13n-3e, dr 690 ft.

CATAHOULA PARISH—McIntyre et al's Tensas Delta 1, sw nw ne 18-10n-2e, sd 210 ft.

CLAIBORNE PARISH—J. C. King et al's Odis Webb 1, nw ne 21-21n-8w, elev 265.6 ft, top Annona chalk 2335 ft, top Blossom 2630 ft, sr to bottom, td 2640 ft, Blossom. E. T. Oakes et al's Patton Est. 1, ne ne 1-20n-5w, elev 357.3 ft, top Cane River 650 ft, wocs 12½-in csg 655 ft, hd black shale.

DE SOTO PARISH—E. B. Bird et al's A. D. Johns, Jr. 1, se nw 20-14n-16w, elev 290 ft, 6-in csg 2583 ft, sd 2645 ft. Flesh & Hootkins' Farmer 1, se se 14-12n-13w, abn hole flowing 36.4 oil by heads, re-bldg dk and rur, td 3035 ft. Frailey et al's J. E. Stell 1, 5-12n-16w, rur. C. T. Ruffin's Elmo P. Lee 1, nw sw 33-14n-13w, 6⅝-in csg 2785 ft, top Tokio 2811 ft, tested dry so, pulling liner to deepen, td 2825 ft. The Hunter Co.'s De Soto Corp. 1, nw nw 29-12n-14w, dr 2610 ft.

EAST CARROLL PARISH—Century Oil & Drlg. Corp.'s Olivedell Pltg. Co. 1, 56-21n-12e, sdtr at 1680 ft, old td 2540 ft, black shale.

GRANT PARISH—Alexander et al's Maxwell 1, 9-9n-1e, rur.

JACKSON PARISH—American Liberty Oil Co.'s Lusk 1, cent ne ne 1-16n-1w, 12½-in csg 275 ft, dr 3115 ft.

MADISON PARISH — Southern Land & Expl. Co.'s Deltic Inv. Co. 7, nw nw 1-17n-12e, 12½-in csg 200 ft, dr 1750 ft.

MOREHOUSE PARISH—J. H. Gibson et al's Thomas 1, ne ne 16-22n-7e, spd 10-in csg 200 ft, dr 250 ft. Zeigen & Bacon's Crossett Lbr. Co. 2, se sw 36-23n-6e, spd and sd.

NATCHITOCHES PARISH—Clyde Creighton et al's Friedman Est. 1, swc 52-7n-6w, sd for electrical tester, td 3560 ft. Edwards & Turner's Prudential Life Ins. Co. 1, nw nw 26-10n-6w, dk. Howard & Kittrell's De Blieux 1, nwc 83-10n-7w, wocs 12½-in csg 190 ft. Missouri Drlg. Co.'s Brown Lbr. Co. 1, 5-10n-10w, sd 1070 ft. Roy Raines et al's Raines 1, sw sw 28-9n-10w, sd for drill stem 3565 ft.

OUACHITA PARISH — American Liberty Oil Co.'s Golson 1, cent nw nw 25-17n-1e, fsg drill stem td 2685 ft.

RED RIVER PARISH—Howard & Kittrell's Chaffraix 1, 30-12n-10w, dk.

SABINE PARISH—M. T. Hines' J. B. Hill 1, sw ne 4-6n-11w, 6-in csg 2275 ft, dr 2955 ft.

TENSAS PARISH — H. B. Schumacher's Curry 1, 39-12n-11e, sd 4147 ft.

UNION PARISH — Crescent Drlg. Co.'s Woolie 1, ne ne 34-19n-1e, dr 1880 ft. J. I. Roberts Drlg. Co.'s Seale 1, sw se sw 7-23n-1w, spd, cemt 10-in csg 195 ft, dr 1600 ft. Southern Prod. Co.'s W. E. Clark 1, se nw nw 17-23n-1e, sd 2296 ft.

WEBSTER PARISH—Burnett et al's Fulbright 1, ne ne 1-18n-10w, dk.

WINN PARISH—P. E. Parsons et al's Tremont Lbr. Co. 1, nw sw 10-12n-2w, dk and mir.

MICHIGAN

MIDLAND COUNTY—Brehm & Hollman's Gould 1, 15n-2w-19, dr 2300 ft.

ISABELLA COUNTY — McClanahan Oil Co.'s Currie 1, 16n-4w-34, dr 1800 ft. United Driller's Vandercook 1, 15n-3w-24, sd 2660 ft. Atha Oil Co.'s Fordyce 1, 16n-5w-34, dr 1800 ft.

GLADWIN COUNTY—Sun Oil Co.'s Hines 1, 17n-1w-31, testing so 3998 ft; Peterson 1, 17n-1w-19, dr 1600 ft; Fanslau 1, 18n-2w, ne nw-6, dr 180 ft. Strange Oil and Gas Co.'s Spicer 1, 17n-2w-11, dr 3960, so.

CLARE COUNTY—Farwell Oil and Gas Co.'s Siegel 1, 17n-5w-26, dr 3400 ft. T. K. Buzard's Newell 1, 17n-3w-19, sp.

MECOSTA COUNTY — Jetter Oil Co.'s Parsley 1, 14n-10w-19, dr 3410 ft. Gordon Oil Co.'s Taylor 1, 13n-8w-25, dr 1000 ft.

OSCEOLA COUNTY — Smith Petroleum Co.'s Moser 1, 17n-10w-20, dr 3600 ft. Gordon

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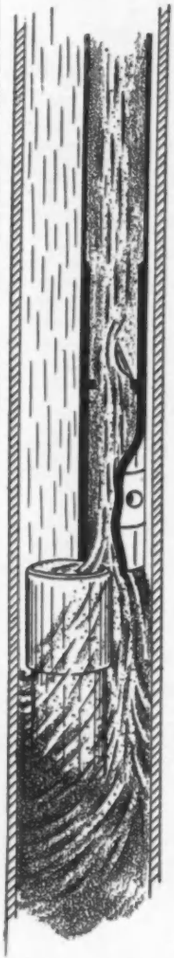

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Oil Co.'s Giese 1, 18n-10w-34, dr 900 ft. Sun Oil Co.'s McLaughlin 1, 17n-8w-35, rig.

NEWAYGO COUNTY — C. W. Teater's Sawyer 1, 12n-12w-5, dr 1500 ft. West Ashlund Dev.'s McKinley 1, 11n-13w-8, sd 2210 ft.

MONTCALM COUNTY — L. E. Duvall's Eiknorch 1, 11n-10w-13, co 1340 ft. Rex Oil and Gas Co.'s Olsen 1, 9n-7w-14, dr 2220 ft. Gordon Oil Co.'s Paulson 1, 12n-9w-24, dr 1200 ft.

GRATIOT COUNTY—Kircher and Moffett's Shaver 1, 10n-4w-4, csg 3186 ft. Newark Oil and Gas Co.'s Beck 1, 10n-3w-29, re-csg 3187 ft. Michigan Gas and Oil Co.'s Dean 1, 11n-3w-30, dr 350 ft.

MISSISSIPPI

GRENADA COUNTY—W. L. Stewart et al's W. W. Wood 1, se ne 19-22n-5e, cemtd 12½ in surf csg 585 ft, dr 1451 ft black shale.

MADISON COUNTY—Cleve Love et al's P. F. Simpson 1, nw nw 30-8n-1w, lcn.

MONROE COUNTY—P. J. McAlpine et al's Crook 1, nw ne ne 4-13s-18w, elev 413.6 ft, arr test sg, td 2531 ft.

RANKIN COUNTY — Cleve Love et al's Ascher 1, ne ne 18-5n-2e, elev 275 ft, dr 2105 ft Wilcox.

WINSTON COUNTY—Jack Vale's Moody 1, sw nw sw 3-13n-14e, elev 540 ft, top Eutaw 1826 ft, arr test sg, td 2250 ft green sand (Eutaw).

MONTANA

BIG HORN COUNTY—Enterprise Oil Co. and Norbeck Drilling Co.'s Lynde 2, sw nw se 21-6s-35e, co to 3590 ft and run new 4¾ in csg, dr 3600 ft

CARBON COUNTY—Bailey Round Butte Oil Co., Test 1, ne-se 3-6s-23e, dr 900 ft and land 5 3/16 in csg 800 ft.

FERGUS COUNTY—Emmons et al Test 1, ne-se 6-20n-18e, dr 950 ft.

GALLATIN COUNTY — Montana Gas & Pet. Co.'s Tyce 1, ne-ne ne 28-1n-2e, dr 2200 ft.

PETROLEUM COUNTY — Hardendorf & Keyes' Austad 1, sw nw nw 22-13n-28e, dr 300 ft.

PONDERA COUNTY—Texas' Unit-5-1, csw sw 3-30n-5w, dr 450 ft. Norden Corp.'s Hollam 1, nw nw 12-28n-6w, dr 150 ft.

ROSEBUD COUNTY—Birney O&G Co.'s Fee 1, sw sw sw 6-6s-42e, dr 400 ft.

STILLWATER COUNTY—Continental Oil Co.'s Orr 1, sw nw se 18-5s-17e, dr 2975 ft.

TOOLE COUNTY—Kyle's Clark 1, csw se 24-37n-1w, running 10-in cas to 1050 ft. Fraser & Klut's Severence 1, cse ne 29-32n-2e, dr 1600 ft.

NEW MEXICO

CHAVES COUNTY — John Tannehill's Campbell 1, ne se ne 1-11s-25e, ur 10 in csg to bottom 400 ft for water shut off. Comanche Drilling Co.'s Sloope-Purcell 2, cne ne 15-11s-26e, mim.

SANDOVAL COUNTY — Continental's L-Bar Cattle Co. 1, se 2-13n-4w, dr at 869 ft.

SAN JUAN COUNTY—Kutz Canyon Oil Co. Day 1, sw sw sw 20-28n-11w, fsg 4380 ft.

SAN MIGUEL COUNTY—Cabra Springs O&G Co.'s Pino Mesa 1, sw ne ne 22-12n-22e, dr in shale 4025 ft. Cabra Springs West Pino Mesa 2, sw sw sw 31-12n-22e, dr 700 ft.

EDDY COUNTY—Geo. F. Getty Oil Co.'s Andrew Dooley 7, swc nw 24-20s-29e, elev 3309 ft, rust, td 6053 ft.

LEA COUNTY—Amerada's H. F. Andrews 1, c nw nw 12-20s-36e, Monument area, elev 3576 ft, top anhydrite 933 ft, top salt 1195 ft, dr 1830 ft. Argo Royalty Co.'s B. A. Burner-The Texas Co. 2, c se se 8-20s-32e, elev 3584 ft, top salt 1025 ft, dr 1700 ft. Anderson-Prichard's Fisher 1, c se ne 8-20s-35e, elev 3690 ft, top anhydrite 1945 ft, top salt 2000 ft, sulphur w 4325-75 ft, co to dd to 4500 ft. Culberson & Irwin's Eva Brown 1, c ne ne 23-21s-32e, lcn; Sue Richardson 1, c sw se 10-21s-32e, lcn. Amon G. Carter et al's G. H. Mattix-Conoco 1, c se nw 3-24s-37e, elev 3528 ft, top anhydrite 1090 ft, top salt 1225 ft, top brown lime 2547 ft, sulphur w in lime 3935-40 ft, (corrected to 3908-13 ft), swabbed 83 bbls oil and some w in 18 hrs, pb to 3885 ft. R. H. Henderson et al's P. J. Langley 1, c se se 8-25s-37e, elev 3162 ft, top salt 1205 ft, est 1,500,000 ft gas at 3212 ft, spray oil 3343 ft, sd for tanks. Humble's J. L. Coates 1-A, nw ne 10-24s-36e, elev 3385 ft, top anhydrite 1324 ft, top salt 1433 ft, flowed 44 bbls oil per hr on dst at 3500-60 ft, sd to cem cas; Coates 3, c nw nw 10-24s-36e, rig. Jeffers Oil Co.'s Carlson 1, c nw se 27-25s-37e, elev 3025 ft, reaming 460 ft; Britt-Concco 1, c se nw 7-20s-37e, Monument area, elev 3554 ft, dr 350 ft. Leonard et al's Justis 1, swc nw nw 20-25s-37e, elev 3067 ft, sd for water 1815 ft. Maljamar O&G Corp.'s Simon 1, c ne ne 29-17s-32e, Maljamar field, lcn; P. Miller 1, c nw se 23-17s-32e, elev 3992 ft, pb fr sulphur w at 4195 ft, to 4190 ft, swabbed 30 bbls oil and sw, pb to 4170 ft. Ohio's State-Maxwell 1, c ne nw 16-22s-36e, elev 3573 ft, cem surface cas. Skelly's Coates 1, c sw se 3-24s-36e, Cooper area, elev 3392 ft, rig. Sun's W. B. Maveety-Weir 1, c ne se 35-19s-36e, Monument area, elev 3601 ft, top anhydrite 1008 ft, top salt 1160 ft, dr 3800 ft; H. S. Record 1, c nw nw 22-22s-36e, s Eunice field, rig. Superior's State 1, c ne ne 2-20s-36e, Monument area, elev 3596 ft, top anhydrite 980 ft, coring 3903 ft. Texas Co.'s Saunders 1, c se sw 18-10s-37e, Monument area, elev 3693 ft, top anhydrite 1288 ft, top brown lime 2585 ft, blew out est 55,000,000 ft gas, td 3900 ft, sd to cem 7-in cas 3762 ft. W. L. Todd and Texas Co.'s Cole 1, c ne ne 35-19s-33e, elev 3603 ft, top salt 1540 ft, top white lime 3250 ft, sulphur w at 3513-18 ft, dry and abd 4150 ft. TP C&O Co.'s State 1, lse 2, c se sw 9-22s-36e, s Eunice area, elev 3567 ft, dr 955 ft.

OKLAHOMA

ATOKA COUNTY—Wilkerson's 'Galbreath 1-A, nw se se 5-1n-15e, td 305 ft, lowering 6⅝ in csg. R. H. Pierce et al's Aetna 1, nw sw ne 10-1n-13e, so sdy sh 330-450 ft, td 830 ft. R. W. Vierson et al's Williams 1, ne sw nw 34-2s-10e, rust. Sears' Davis 1, se se se 18-1s-14e, lcn. Sears' Downing 1, se se nw 17-1s-14e, sd. W. L. Kistler's Brown 1, sw sw sw 19-1s-12e, rog.

BECKHAM COUNTY—E. M. Cluck's M. C. Riley 1, nw nw nw 36-9n-25w, mit for 2800 ft test. United Carbon Industries' Eason 1, cnw nw 11-9n-25w, dr 3483 ft. Martin's Robinson 1, cne se 1-9n-22w, spd with machine, now mir.

BRYAN COUNTY—Trio Oil Co.'s Gilbert 1, sw ne sw 25-8s-7e, sand 829-34 ft, hfw, so, td 835 ft, ur 8-in csg. Smith's Henry 1, cnw ne 10-8s-7e, rig. J. D. Parks' Coats 1-A, se ne sw 1-5s-8e, flow artesian water, sd. C. B. Welch's M. Collins 1, sw sw nw 19-8s-8e, dr 650 ft.

CADDO COUNTY—Denver P&R's Sah-Cam 1, cse se 33-10n-10w, dr 7600 ft. H. W. Lee et al's Horton 1, ne ne ne 9-6n-13w, ru and sd. Lee et al's Stacey Ferrell 1, sw ne ne 3-6n-13w, td 2292 ft, co bad hole.

CARTER COUNTY—Waco Turner's A. F. Munson 1, ne nw ne 35-5s-2w, dr 4520 ft. Carter's Humble-Williams 1, sw ne sw 27-2s-3w, dr 6471 ft, in Viola.

CHOCTAW COUNTY—E. B. Abernathy's Christian 1, sw se se 1-6s-19e, 10-in csg 253 ft, sand 125-250 ft, hfw, dr 290 ft.

CLEVELAND COUNTY — Mayes Inc.'s Faut 1, sw sw ne 27-10n-2w, cellar and pits. Arab Pet. Co.'s (R. F. Garland et al) McKiddy 1, se se nw 16-7n-1e, lcn.

COAL COUNTY — Carter et al's John Thompson 1, csl ne nw 34-2n-9e, dr 3500 ft. Amerada & Stanolind et al's Travelers 1, sw nw se 28-1s-9e, dr 3100 ft.

GRANT COUNTY — Helmerich-Payne's Crouse 1, cne sw 29-25n-8w, Miss. Ls. green shale break 6347-51 ft, Woodford 6354 ft, dr 6371 ft. Westgate's Clark 1, nw ne nw 17-29n-4w, spd. L. H. Wentz's Wirtz 1, se se nw 22-28n-4w, mim. Helmerich & Payne's Crouse 1-A, 29-25n-8w, Woodford shale 6354 ft, dr 6385 ft.

GREER COUNTY — H. N. Payne et al's Tressell 1, nw nw nw 1-7n-22w, co 1450 ft. Rockwell et al's Stephens 1, csl se 32-6n-24w, mach. Gled Oil Co.'s Simpson 1, ne ne ne 11-5n-22w, sandy ls., sg 650-55 ft, sand 770-80 ft, wtr 730-31 ft, dr 930 ft in granite wash. Fred Morgan et al's H. G. Carder 1, csw se 19-4n-22w, td 3230 ft, fsg dr pipe.

HARMON COUNTY—Mathis' Keith 1, se nw sw 12-5n-26w, machine on ground. D. E. Whatley et al's Hamilton 1, nw nw se 25-4n-24w, cellar and pits. Massad and Caudle's Crosnoe 1, se se sw 14-3n-25w, rig.

HUGHES COUNTY—Texas Co.'s Keeton 1, nwc sw 4-8n-10e, pb 3715 from 4086 ft, Mayes ls. 3580, Sylvan shale 3835, Viola 3940, rust. Caprock Oil Co.'s Parks 1, sw sw se 34-7n-8e, rig.

JACKSON COUNTY—Triangle P&R Co.'s Fox 1, cnl se sw nw 11-3n-20w, dr 490 ft. J. G. Buell et al's M. E. Kizziar 1, se se ne 2-2n-22w, brkn granite wash 2435-85 ft, td 2504 ft, 350 ft wih, abd. Palo Duro Oil Co.'s Ealum 1, sw sw se 16-2n-21w, dr 1710 ft. Petroleum Prod. Co.'s C. W. Cole 2, se sw se 34-2n-20w, completed 40 bbls. Selby O&G Co.'s Cobb 1, ne nw ne 22-1n-20w, granite wash 1530-68 ft, so 1545-47 ft, dr 1590 ft. Gypsy's Boucher 1, nw sw sw 32-1n-19w, td 2295 ft, swage 6⅝ inch csg. Dengail Oil et al's Robinson 1, se se ne 32-1s-22w, dr 1000 ft.

JEFFERSON COUNTY—Howell's Curry 1, se se sw 36-4s-9w, lcn.

JOHNSTON COUNTY—Neff's Rutherford 1, ne se nw 13-4s-5e, ru machine.

KAY COUNTY—Marshall-Haddock et al's Hermes 1, sw sw nw 6-26n-4e, dr 385 ft in new hole. J. T. Lindsay's Waggoner 1, nw nw ne 3-27n-1e, dr 2393 ft. Lewis Prod. Co.'s Summers 1, sw se nw 17-27n-2e, Layton sand 2825 ft, Big ls, 4149 ft, 6-in csg 3150 ft, dr 3155 ft.

LE FLORE COUNTY—McGraw et al's Tidwell 1, cnw se 17-32n-22e, 20-in csg 75 ft, wocs.

LINCOLN COUNTY — Stanolind's Cava-

naugh 1, se se ne 31-15n-5e, dr 3785 ft. Texas Co.'s Niccum 1, se sw nw 28-14n-5e, Oswego ls. 3540 ft, Misener sand 3541 ft, Hunton ls. 3548 ft, 8¼-in csg 4590 ft, td 4644 ft. Stanolind's Davison 1, nw nw nw 4-14n-3e, lcn. Amerada and Stanolind's Connelly 1, se ne se 23-14n-2e, dr 1000 ft.

LOGAN COUNTY — Houghton Royalty's Langston Townsite 1, sw sw se 13-17n-1w, cellar and rig corners. Sinclair Prairie et al's Foree 1, ne ne ne 1-16n-1w, 15½-in csg 295 ft, td 300 ft wocs. Sinclair and Slick Urschel's Koatsch 1, swc 23-15n-3w, pb 6332 ft, bailing. Continental's J. J. Hildreth 1, se se sw 22-15n-3w, 7-in csg 6220 ft, wocs. Freeland et al's Scrutchfield, nw nw ne 9-16n-1e, rog. Stanolind and Amerada's Comm. Nunn 1, se se nw 25-15n-1e, abd 5477 ft.

LOVE COUNTY—Sinclair Prairie's Stockton 1, se se sw 26-6s-2w, mir.

MAJOR COUNTY—I.T.I.O. and Continental's Fairview 1, csw se 32-22n-14w, dr 4860 ft.

MARSHALL COUNTY—Smith's Chestnut 1, ne ne ne 23-8s-5e, ru machine, 800 ft test. Schermerhorn Oil Co.'s Rich 1, sw se se 35-4s-4e, dr 674 ft.

MURRAY COUNTY—Hernsby and Jones' Sadler 1, ne ne nw 20-1n-2e, mir. Bland et al's Center 1, ne ne ne 6-4s-2e, 10-in csg 25 ft, sd 165 ft. Equitable O&G Co.'s Ferguson 1, ne ne sw 36-1s-3e, td 1619 ft, fsg.

NOBLE COUNTY—Harry Chapple's Ragan 1, nw se nw 29-21n-1w, td 1053 ft, ur 10-in csg.

OKFUSKEE COUNTY—Sunray's Culla 1, ne sw ne 13-12n-8e, mit.

OKLAHOMA COUNTY—Texas Co.'s Wood 1, sw sw ne 34-15n-4w, lcn. Sinclair Prairie's Glen 1, ne ne se 27-15n-3w, dr 2367 ft. Gypsy and I.T.I.O.'s Salisbury 1, nw ne ne 13-14n-4w, Checkerboard ls. 5240 ft, dr 5250 ft. J. E. Mabee's Duellbert 1, sw ne se 20-13n-3w, spd. Slick-Urschel et al's Zielny, ne ne sw 29-13n-3w, 13⅜-in csg 15 ft, wocs. Slick-Urschel's Meeker 1, nw nw nw 29-13n-3w, building rig. Burns Oil Co.'s Owens 1, sw ne se 29-13n-3w, cellar and pits. Sinclair Prairie's Corbett 1, ne nw ne 17-13n-3w, 2nd Wilcox sand 6645-6706 ft, testing.

OSAGE COUNTY — Danciger Ref. Co.'s Osage 1, ne ne se 1-25n-6e, ru machine.

PAWNEE COUNTY — Stanolind et al's Shunatana 1, ne sw se 32-22n-3e, 12¼-in csg 155 ft, td 200 ft, wocs.

PAYNE COUNTY—Amerada's Freidman 1, se se se 28-19n-3e, dr 2608 ft.

PITTSBURG COUNTY—Gray's Lee 1, nw nw se 12-5n-13e, sd 1210 ft.

PONTOTOC COUNTY—Phillip Boyle's McCracken 1, ne nw nw 31-5n-4e, pump salt water, ru to dd. Phillips Pet. Co.'s Crist 1, sw se sw 30-5n-4e, cellar and pits. Southern Oil's Walker 1, nw nw sw 11-4n-6e, sd 1172 ft. Fleetborn's Oliver 2, ne nw se 21-4n-5e, 8¼-in csg 848 ft, sand 848-86 ft, estimated 10,000,000 at 855 ft, sand 927-38 ft, hfw, csg 950 ft, fsg. Frank's Abbott 1, sw nw ne 34-3n-6e, rotary rig. Leonard Williams et al's Breedon 1, nw nw nw 6-2n-5e, sd 40 ft. Continental's McCarthy 1, csw nw 12-1n-7e, mir. Gillette and Kroeger's Duver 1, nw nw se 36-1n-6e, sd 1325 ft.

PUSHMATAHA COUNTY—Wm. Ungerman et al's Messer 1, se sw sw 35-3s-18e, dr 3222 ft.

SEMINOLE COUNTY—Van Deventer et al's Bender 1-A, ne ne sw 3-8n-8e, td 3254 ft. Tom Phillips et al's Abbott 1, ne ne ne 33-8n-7e, pb 3198 ft, sand 3140-3200 ft, 7-in csg 3124 ft, flow 15 min head 2000 ft oih. Carter and Shell's Brown C-41, cw½ se sw 23-8n-5e, dr 3425 ft. Jobe's Baker 1, se sw nw 8-6n-7e, dr 2942 ft. Droppleman's Abb 1, se nw se 4-6n-6e, rig.

STEPHENS COUNTY—Wm. Angle et al's Cooper 1, ne nw nw 23-2n-7w, td 4280 ft, dr pipe stuck. Morgan Pet. Co.'s Calloway 1, se se ne 17-1n-8w, abd 2190 ft.

TILLMAN COUNTY — Rock Island Ref. Co.'s Lynch 1, cse sw 35-1s-16w, fsg 1020 ft.

EAST TEXAS

ANDERSON COUNTY — Gulf's Southern Pine 2-A (115.9-ac), J. C. Rosson sur, Camp Hill area, elev 655 ft, dr 1000 ft; Southern Pine 3-A (115.9-ac), elev 598 ft, rig. Tide Water-Texas Seaboard's N. N. Wills 21-A, Cayuga field Trinity sand test, elev 308 ft, showing heavy gas pressure in Trinity sand, dr 8800 ft; Shaw & Cern 1 (1216-ac), Daniel Parker sur, Long Lake area, elev 300 ft, Pecan chalk 3580-3618 ft, Austin chalk 4654-4905 ft, top first gas sand 5174 ft, coring 5320 ft; C. T. Valentine 1 (301-ac), John Little sur, 9 mi n of Palestine, elev 454 ft, Pecan chalk 3622-3920 ft, Austin chalk 4725-4981 ft, top Woodbine series 5160 ft, pb fr sw sand 5282 ft, to 3000 ft, sdtr and dr 3510 ft.

BOWIE COUNTY—Woodley & Bentley's Lumpkin 1 (245-ac), John McDermott sur, mim.

CAMP COUNTY—E. J. Moran, G. E & Ray Hubbard's W. M. Mitcham 1 (100-ac), L. Rose sur, 1½ mi n of Newsome, lcn.

CASS COUNTY—Stanley A. Thompson et al's G. H. Allen 1 (150-ac). Wm. King sur, 3 mi s of Hughes Springs, lcn.

CHEROKEE COUNTY—H. A. Baker & Florence Oil Co.'s Tol Smith 1 (40-ac), Jose Pineda sur, 4 mi nw Jacksonville, elev 547 ft, Pecan chalk 3520-3937 ft, top Austin chalk 4490 ft, dr shale 4790 ft. Clark-Cowden Drlg. Corp.-R. J. St. Germain & L. J. O'Connor's J. G. Long 1 (54.65-ac), Don T. Quevado League, blk 13, 1 mi s of Mount Selman, elev 668 ft, sp. Roberts Bros. et al's H. E. Pryor 1 (3-ac), Jessie T. Jones sur, Rusk pool, lcn. Shell's New Birmingham 1 (1040.38-ac), Levi Jordan sur, Rusk pool, elev 487 ft, top Pecan chalk 4045 ft, dr 4150 ft. T. J. Wood & Young's New Birmingham 5 (160-ac), Levi Jordan sur, Rusk pool, rig.

FRANKLIN COUNTY—J. E. Farrell & Co.'s G. K. Ayres 1 (50-ac), Chas. H. Simms sur, elev — ft, Pecan chalk 2425-2660 ft, Austin chalk 3785-3863 ft, top Woodbine 4292 ft, dry and abd 4400 ft.

GREGG COUNTY—L. P. Kean et al's S. M. Smith 1 (120-ac), W. W. Avery sur, rig.

HENDERSON COUNTY—Edson Pet. Co.'s C. L. Loper 1 (3-ac), I. Clendennen sur, Cayuga area, lcn. Illinois Oil Co.'s C. R. Litchfield 1 (4½-ac), I. Clendennen sur, Cayuga area, lcn. C. D. Neff et al's H. G. Small 1 (20-ac), Isaac Greeson sur, 4 mi nw Cayuga field, elev 284 ft, Pecan chalk 2176-2225 ft, top Austin chalk 3148-3516 ft, top Woodbine 4035 ft, sd for water. O. M. Rector et al's C. L. Loper 1 (3½-ac), I. Clendennen sur, lcn. Stroube & Stroube's C. L. Loper 1 (11.31-ac), I. Clendennen sur, elev 330 ft, tested gas on dst 4098 ft, sd for cas. Fred Upchurch et al's C. L. Loper 1 (3½-ac), I. Clendennen sur, Cayuga area, elev 331 ft, Pecan chalk 2235-2454 ft, Austin chalk 3279-3663 ft, pb fr 4096 ft to 4091 ft to shut off water. J. K. Wells et al's W. E. Warren 1 (121-ac), Thos. Hanna sur, 4 mi w LaRue, lcn.

HOPKINS COUNTY—D. A. Hale et al's L. N. Hall 1 (70-ac), A. Caro sur A-143, elev 508 ft, Pecan chalk 1825-2040 ft, top Austin chalk 2728 ft, sd 2950 ft.

HUNT COUNTY — J. F. Morrissey Co., Inc.'s P. B. Fry 1-A, (146-ac), Calloway Davis sur, 7 mi se of Ladonia, elev 561 ft, coring 2453 ft. H. G. Samson, Shawver et al's J. R. Phillips 1, W. L. James sur, elev 522 ft, Pecan chalk 556-631 ft, top Gober chalk 1202 ft, top Woodbine 2596 ft, top Red Beds 2750 ft, dry and abd 3262 ft.

KAUFMAN COUNTY—G. H. Germany et al's D. Clark-W. S. Kirby 1, S. Edens sur, sd 1780 ft. Murray & Emerson's G. W. Martin 1 (100-ac), W. F. C. Butler sur, top Taylor 840 ft, top Wolfe City sand 1625 ft, dr 1780 ft

LIMESTONE COUNTY—Dan H. Daugherty et al's Sallie Welch 1 (94-ac), Pedro Varella sur, Austin chalk 2350-2650 ft, top Woodbine 2890 ft, dr shale 3090 ft. J. Edward Mills et al's J. B. Hunt 1 (34¼-ac) Isreal Woods sur, 3 mi ne of Kosse, Pecan chalk 2010-2137 ft, Austin chalk 2780-3158 ft, top Woodbine 3578 ft, sd 3654 ft. Yandell Rogers, Reiter & Foster's J. M. Tidwell 1 (230-ac), 2½ mi sw of Mexia field, dr 1820 ft.

MORRIS COUNTY—J. N. Buchanan et al's P. M. Staggers 1, J. D. Nelson sur, elev 363 ft, top Woodbine 4269 ft, testing 4259 ft. Joiner et al's fee 1, Wm. Coffey sur, lcn. Steve J. Rotondi et al's W. & C. Smith 1 (50-ac), M. C. Vela sur, 2½ mi sw Naples, dr 640 ft. B. L. Watson et al's E. Hall 1 (177-ac), Levi Jordan sur, 5 mi ne of Daingerfield, sd 4159 ft.

NAVARRO COUNTY—L. N. McCulloch et al's Berry Bros. 1 (35-ac), W. W. Moss sur, Austin chalk 751-1060 ft, sd 1182 ft. E. M. Thomason & Co.'s Celia Moran 1 (100-ac), Wm. Haggard sur, top broken Austin chalk 1258 ft, top hard chalk 1288 ft, dr 1720 ft. Wiggins & Albritton's D. A. Donoho 1 (63½-

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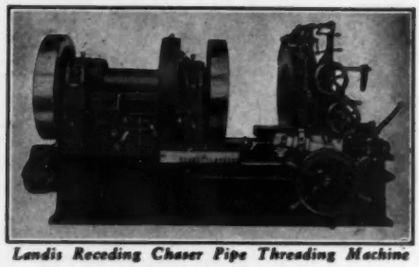

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ac), John Caudle & Highnote sur, 2 mi sw Corsicana, elev 467 ft, sd 1439 ft.

RAINS COUNTY—W. A. Allen-Geo. W. McClung & Harry B. Baker's Ida Bullard 1 (75-ac), Nancy Brantley sur, 2 mi sw of Emory, dk; Mrs. Olma Giles 1 (77-ac), Thos. Cunningham sur, 6½ mi sw of Emory, dk.

RED RIVER COUNTY—Porter Newman, Tr., et al's R. L. Gibson 1 (58-ac), W. L. Gibson sur, 2½ mi se Bogata, lcn. A. N. Gibbons et al's B. A. Rust 1 (1915-ac), C. C. Welborn sur, s edge of Avery, dk.

ROBERTSON COUNTY — J. C. Kilgore, Tr., et al's Ely 1 (616¾-ac), Antonio Manchacha sur, (shallow test), sp and sd. H. L. Patton Co.'s W. H. & H. A. Ely 1 (616¾-ac), Antonio Manchacha sur, 5 mi se of Hearne, elev 392 ft, top Carrizo 661 ft, sd 3840 ft.

RUSK COUNTY—Ben E. Lamb et al's Haywood Leath 1 (185-ac), L. J. Dooley sur, 2½ mi ne Pirtle, elev 370 ft, Pecan chalk 2418-2793 ft, Austin chalk 3352-3512 ft, td 4750 ft, pb to 4710 ft, sd. Stewart & Egan's Hall Wood 1 (847-ac), blk 12, Jose I. Sanchez sur, elev 310 ft, Pecan chalk 3030-3740 ft, top Austin chalk 4215 ft, sd 4404 ft. J. W. Shipman et al's City Nat'l Bank 1 (125-ac), Juan Jose Y'Barbo sur, 4 mi ne of Henderson, rig.

SMITH COUNTY—J. C. Bowers et al's Malcolm Landers (W. W. Holland) 1 (215-ac), S. A. & M. C. Ry. sur A-968, 3 mi ne of Jamestown, elev 386 ft, Pecan chalk 3000-3200 ft, sd 3645 ft. R. W. Fair et al's Fred Terrell 1 (72-ac), Eli Delk sur, 2½ mi ne of Sand Flats, elev 419 ft, Pecan chalk 3250-3660 ft, Austin chalk 4588-4700 ft, top Woodbine 5005 ft, dry and abd in sw sand 5230 ft.

TITUS COUNTY—Steve J. Rotondi et al's O. C. Lillianstern 1 (40-ac), W. H. Crawford sur, 5 mi se Talco, elev 301 ft, dk.

UPSHUR COUNTY—Flanagan & Vardeman's W. D. Barber 1 (78-ac), Del Toris sur, 5 mi nw of Glenwood, lcn. R. B. Hollandsworth Drlg. Co.'s Little Sandy Hunting & Fishing Club 1, lcn.

VAN ZANDT COUNTY—Newt Tidwell, W. J. Rogers et al's L. E. Breucher 1-A (98¾-ac), David Clapp sur, 5 mi se Wills Point, dry and abd 4509 ft.

WOOD COUNTY—Atlatl Royalty Corp.'s J. B. Goldsmith 1 (693.3-ac), W. W. Lanier sur A-358, 3 mi nw of Quitman, elev 453 ft, Pecan chalk 2450-2636 ft, Austin chalk 3807-3973 ft, top Woodbine 4448 ft, top Red Beds 4680 ft, fsh 5040 ft.

HARRISON COUNTY — Adams & Bird's Washburn 1, F. Jordan sur, dk. Itex Oil Co.'s T. J. Taylor 1, W. H. Payne sur, fsg, td 3985 ft. Roy C. Swails et al's Pitts 1, sec G. W. Martin sur, sd 1810 ft. Hanover, Bergendall et al's Buchanan 1, installing new rig, td 3682 ft. Hammonds & Williams' W. T. Cock 1, J. N. Sorrell sur, sd 2500 ft.

PANOLA COUNTY—J. L. Cadrin's Robt. Johnson 1, sur, dk. Flinchbaugh & McAneny's H. G. McCormick 1, Jas. P. McAdams sur, 10-in csg 150 ft, G. F. Hudson's J. F. Nail 1, C. McCrary sur, sd 2387 ft. Geo. Le Grand's P. J. Laidleigh 1, A. Thompson sur, sd 885 ft. S. B. Wallace 1, A. M. McLaughlin sur, rog.

SAN AUGUSTINE COUNTY — Hunter Co.'s Long-Bell 1, Galloway sur, dr 2205 ft.

SHELBY COUNTY—Bradley et al's Ashberry 2, Mitchell sur, sd 3390 ft. Litchfield et al's Windham 1, English sur, sd 3595 ft. J. W. Reynolds et al's Polley 1, Christenberry sur, mim. Tarbud Oil Co.'s Pickering 1, Woodfin sur, dr 2245 ft; Pickering 2, Forsyth sur, dr 2340 ft.

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ATASCOSA COUNTY—R. McIntyre's H. A. Billinck, J. B. Woodleff sur No. 246, 7½ mi e Coughran, sp and sd.

BANDERA COUNTY — Palm Winn Oil Co.'s R. B. Watson 1, sec 71, 2 mi n Medina City, dr 1745 ft. Plateau Oil Co.'s R. G. Garrison 1, sec 506, GC&SF sur, 8 mi sw of Medina City, re-dr 3409 ft.

BASTROP COUNTY—Batts & Jarmon's A. Paris 1, J. Maximillian sur, n Dale area, dr 2115 ft. Malone & Owens' S. S. Spooner 1, L. Leverenz sur, 6 mi sw Hilbig field, temp abnd 2170 ft. Marts & Beavens' Leatherwood 1, W. McLanglin sur, dr 2740 ft. Nelson Puett's Carrol 5, A. Mays sur, Carroll district, td 2385 ft, pb 2314 ft, testing. F. Wilson's M. C. Callaham 1, 330 ft nl and wl, 224 ac tr, Mays sur, lcn.

BEE COUNTY — G. M. Church's J. C. Woods 1, J. Ryan sur, 3½ mi s Beeville, set 550 ft sur csg, re-dr. John Deering et al's Pullin 1, W. W. Grant sur, ¾ mi ne Rutledge pool, dr 3441 ft. Dirks Bros.' Johnson 1, J. M. Uranga gr, ¼ mi n Normanna, abnd 4370 ft. L. A. Douglas' Imogene Hall, T. J. Butler sur, ½ mi ne Dirks pool, dst 3917 ft. Fox & Heflin's A. M. Holzmark 1, 330 ft nl and el of Richard Jones sur, Foley area, ru. Humble's J. C. Woods 1, Wm. Burk sur, 12 mi se Beeville, making dst 4865 ft. Francis P. Hynes et al Theo. M. Plummer 1-A, Theo. M. Plummer sub, sec 33, Chessman sur, 4 mi sw Caesar field, dr 1280 ft. Littlejohn et al's Borroum 1, Wm. Gill sur, ½ mi nw Rutledge pool, sd 125 ft. United Prod. Corp.'s G. A. Ray 51, 450 ft due nw 50, G. A. Kerr sur, sw of n Pettus field, dr 3200 ft. Worth Oil Co.'s Rutledge 1-B, A Hadley sur, Patent 364, 1/3 mi sw Rutledge pool, ru. Thos. J. Wrightman's A. J. Kimball 1, S. Winship sur, Grayburg area, td 3820 ft, dr 3484 ft in sdtr hole.

BEXAR COUNTY — American Gas Co.'s Oliver 5, M. F. Rodriquez sur, Gas Ridge, sd 2902 ft for csg. James B. Cunningham et al's L. F. Ridder 1, Baerrera sur, ab 50, 2 mi e McDonna, sd 519 ft, wor. Fay T. Chew et al's Jones 4, sec 9, Jacinto Pena sur, 1½ mi e Adkins, dry and abnd 722 ft. M. A. Fredericks' Fee 1, F. Recardo sur, 12 mi sw San Antonio, sd 1115 ft. C. J. LeCompte's A. Herbst 1, M. Leal sur, 4 mi s San Antonio, dr 220 ft; Mayfield Park 1, sd 362 ft. McPhee & Briggs' Florence Lamb 1, M. de Luna sur No. 4, 22 mi s San Antonio, td 2147 ft, set whipstock 1400 ft. Magna & Morgan's J. Kirkwood 1, Desaque sur, 9 mi sw San Antonio, lcn. Mid-Tex Prod. Co.'s Walker 1, S. N. Dobie sur No. 79, 10 mi n San Antonio, dr 250 ft. J. H. Parker's M. McCloskey 1, F. A. Desaque sur, 5 mi nw Somerset, sd 525 ft. Carrol C. Raborn's A. B. Stephens 1, P. N. Hays sur, 10 mi e San Antonio, sd 410 ft; Claud McCauley 1, Wm. Harris sur No. 52, 4 mi s San Antonio, dr 850 ft; Lee Upson Palfrey 1, Almaniz League, 5 mi se San Antonio, lcn.

BLANCO COUNTY—R. T. Rowe & W. E. Nixon's Polk Morresey 1, T. H. Webb sur, No. 91, 2½ mi e Blanco City, dr.

BROOKS COUNTY—United Prod. Co.'s K. J. Hocker 1, Palo Blanco de Maguelles gr, Palo Blanco area, dr 1500 ft.

CALDWELL COUNTY—Ballard & Whitting's A. G. Bridges 1, S. Seal sur, dr 1400 ft. R. S. Bolling et al's C. F. Robertson 1, John A. Neill sur, dr 1050 ft. Exploration Dev. Co.'s W. T. Mooney 1, S. Seal sur, dr 2190 ft. O. W. Killam's W. D. Moore 1, J. Burleson sur, 1½ mi s Lytton field, dr 500 ft. Ogden & Reed's H. Brewer 1, Martinez sur, abnd 1745 ft. R. Y. Walker's Walker Bros. 2, S. Seal sur, sp and sd.

CALHOUN COUNTY—Continental's Nat'l Realty Co. (Moody) 2, sec 6, blk C. P. Garcia sur, 9 mi se Seadrift, sd 6676 ft. Empire's E. Hartman 1, M. Sanchez sur, Port Lavaca, sand 6269-76 ft, show sw, sd 6276 ft. Halliburton Oil Co.'s D. Burton 2, M. Sanchez sur, Port Lavaca, td 6238 ft set 7 in csg 6220 ft in sand, comp 176 BPD, 12/64 ch. Mart Oil Co.'s Brundett 1, sec 8, Wm. Little sur, Matagorda Island, sd 172 ft. Steinberger Pet. Corp.'s W. A. Shofner 2, Port Lavaca, M. Sanchez sur, coring 6078 ft. Texas Co.'s Hackney 1, B. Rodriquez sur, 5 mi sw Port Lavaca, abnd; W. Shofner 1, M. Sanchez, Port Lavaca, td 6262 ft, pb 6245 ft, swabbing and jetting, pressure low.

CAMERON COUNTY — J. F. Anedrson's Browne 1, blk 397, 3 mi ne Rio Hondo, mir. King Wood Oil Co.'s Champion 1, 311 ac tr, 7 mi nw Brownsville, dk.

DE WITT COUNTY—R. Bourke's Steinman 1, Uriah Blue sur, 6 mi s Yoakum, sp. J. D. Crossman's Kleberg 1, J. J. Tumlinson sur, 2 mi nw Cuero, sd 80 ft.

DIMMIT COUNTY — Diamond Half Oil Co.'s A. Eardley Est. 1, R. G. Morgandale sur No. 6, Ab 1322, 5½ mi nw Carrizo Springs, lcn. Joe Lundin et al's Nueces Lands Irrigation Co. 1, lot 16, blk 7, Bermuda Land sub, 12 mi ne Carrizo Springs, lcn.

DUVAL COUNTY—Benedum & Tree's G. B. Parr 1, San Andres gr, 4 mi se Sweden, dr 3750 ft. Bridwell Oil Co.'s M. C. Hubbard 1, 330 ft nl and wl, sec 71, 1 mi s Loma Novio, ru; J. D. Sutherland 1-A (Sun Lease) w½, sec 122, Hoffman area, sand 2598-2713 ft, comp, jetting, 100 BPD, 11 percent sw. Byrd Oil Corp.'s Wright et al 8, 330 ft nl and wl, sec 101, ru. Buffalo Oil Co.'s C. W. Hahl, 330 ft sl and el of lease, sec 61, sp. Dulce Oil Co.'s H. Serna 1, n nw sec 384, Seven Sisters, abnd 2675 ft. Harvey & Henderson's D. Ruiz 1, sur 125, 2 mi e Sarnosa field, dr 1715 ft. Humble's Smith 1, sec 382, ½ mi sw Seven Sisters, sand 2483-93 ft, dst 2481-91 ft, 1800 ft pipe line oil 20 min, set csg, woc. Intrepid Oil Co.'s Parr Ranch, sec 115, sd 5305 ft for orders. Lipscomb & Daubert's M. C. Hubbard 1, sec 75, sw Loma Novio field, ru. D. H. O'Byrne's Ball 1, sec 3, Agua Poquita gr, 2 mi sw Sweden, dry and abnd 4423 ft. Santa Clara Oil Co.'s Wood Welder 2, sec 385, Seven Sisters, Government Wells sand 2452-68 ft, comp 17 BPH ¼ ch. Stewart & Parr et al's Bishop Cattle Co. 1, nw sec 74, 2 mi nw Hoffman field, dr 3020 ft. T. M. G. Drlg. Co.'s Davidson 1, sec 90, dr 2915 ft.

FRIO COUNTY—Amerada's W. H. Smith 1, J. B. Mason sur, No. 322, 4½ mi sw Pearsall field, dr 6025 ft, shale; Kothman 1, D. L. Crouch sur No. 90/9, ½ mi s Pearsall field, testing csg, sand 3957-61 ft. W. D. Bacon et al's J. F. Burns 1, T. H. Clifton sur, sw Bigfoot, lcn. Midland Oil Co.'s S. A. Joint Stock Land Bank, BS&F sur No. 2, 1 mi s Pearsall town, dr 2420 ft.

GOLIAD COUNTY — Brown & Wheeler's Jennie R. Kaufman 1, 1660 ft sel, 330 ft swl of 300 ac tr (Houston lease), P. Trevino sur, Hords Creek prospect, ru. Diamond Half Oil Co.'s OD. R. Mudd 1, 330 ft nl and wl of 142 ac tr in B&B sur (Shell lease) east outpost n Pettus field, sand 3669-81 ft, set csg, wocs. Keystone Roy. Co.'s C. B. Wood 1, John Shearn sur, 3 mi e Berclair, fsh 5961 ft.

GONZALES COUNTY—Midland Oil Co.'s & Sorrell's Dan Billings 1, 450 ft nel and sel of tr in T. Hammon sur, 4 mi sw Smiley (formerly reported in Wilson County), td 3500 ft, contract depth, ran electric formation testing device, sd for orders. Resource Oil Co.'s Otto Lanbeck 1, J. M. Salinas sur, 3 mi w Gon-

zales, sp. J. J. Elam et al making lcn ne of Ottine prospect, no details.

GUADALUPE COUNTY—J. E. Clark's W. B. Lay 1, J. K. Davis sur, dr 2310 ft. Gode et al's Hicks 1, E. de los Santos Coy, re-dr 535 ft. A. D. Locke's Mrs. N. S. Lowman, C. Campbell League, 1½ mi nw Staples, sd 1810 ft. Minerals Corp. of Texas' Allen Phillips 1, Cortines sur, 10 mi sw Seguin, sd 868 ft. W. A. Scrutchin's A. H. Smith 1, J. B. Cowan sur, W. Staples, sd 550 ft. Suttle et al's Baenzinger 1, A. O. Mansola sur, csg collapsed, try to mill out, may abnd. W. J. Walton's Zoboroski 2, J. D. Clements sur, 6 mi se Seguin, coring 2395 ft, top Austin chalk 2203 ft, acidized, 2380 ft, show abt 6 bbls oil per day.

HIDALGO COUNTY — Bluff Pet. Co.'s Knowles 1, sh 14, Por. 49, 3 mi sw Mission, coring 5310 ft. Cortez Oil Co.'s C. E. Smith 1-C, tr 3-B, por 41, se side Samfordyce, sand 2942-44 ft, making dst. Deering & Kayser's John C. Engleman 1, lot 3, blk 70, Mastena gr, 8 mi ne Edinburg, td 7508 ft, originally dr to td and abd by Union Sulphur Co., taken over by new operator, ru to pb, sdtr and redr lower portion of hole. D. M. C. Oil Co.'s Daskam 1, blk 34, por 45, 4½ mi ne Samfordyce field, td 4414 ft, reinstate, to set liner to td and test again, now co. Maddox, Turnbull & Irwins' John H. Shary 1, lot 21, Shary sub, por 58-59-60, 4 mi se Mission, dr 3375 ft. Mundy & Sons' Guerra 1, tr 12, por 41, 4000 ft n Samfordyce field, lcn. Union Sulphur Co.'s ARGL&I Co. 1, tr 2297, lot 59, N Capisallo district, Llano Grande gr, 1¼ mi ne Mercedes field, td 6431 ft, dr 4306 ft sdtr hole; ARGL&I Co. No. 2, lot 2182, blk 86, N Capisallo district, Llano Grande gr, offset to discovery, td 8044 ft, cutting out ds, 6350 ft in sdtr hole; ARGL&I Co. 4, lot 1, blk 99, N Capisallo district, Llano Grande gr, 1½ mi sw discovery, drlg 1200 ft.

JIM HOGG COUNTY—Miller et al's Yeager 1, blk 6, sec 20, fsh 3530 ft. Phillips et al's Allen 1, blk 293, Pippin sub, Randado gr, set 42 ft 10 in csg, prep to re-dr.

JIM WELLS COUNTY—A. M. Hagen et al's Robt. Adams 1, State sur No. 10, 2 mi sw Alford, dr 725 ft. O. W. Killam's W. D. Wade 7, lot 1, blk 6, Bode sub, S. A. Agua Dulce sur, 1000 ft se No. 4, Sandia, dr 4180 ft. Magnolia's A. A. Seeligson 6, V. Canale sur No. 218, Premont, making dst 6659-63 ft in sand, showing o&g.

KARNES COUNTY—W. C. McBride, Inc.'s N. B. Boultingouse 1, J. S. Menefee sur, 10½ mi e Green, coring 3750 ft. H. A. Pagenkoph et al's Sahm 1, Elijah H. Garret sur No. 257, 12 mi sw Kenedy, elev 464 ft, dr, top Pettus 1973 ft, dry and abd.

KENDALL COUNTY — J. E. Freeman's Gerfers 1, Mark Hodgson sur No. 796, sd 102 ft. Southwestern Dev. Synd. Ltd's Willie Werner 1, Torrey sur No. 781, Sisterdale area, dr 470 ft.

KERR COUNTY—Jeff Love & Eastland Oil Co.'s Jeff Love 5-E, J. Martinez sur, sec 1594, ½ mi se original Love Ranch test, td 5625 ft, reinstated, was abd at this depth, ordered string 5-in csg, waiting arrival, will dd. A. Don Auld et al planning two tests to Ordovician, one in nw portion, other in sw portion county.

KLEBERG COUNTY—Harry Clark's W. S. Rogers 1, lot 1, blk 36, Kleberg sub, sd 750 ft. J. K. Culberson & Fidelity Explo. Synd.s Kivlin 1, lot 4, blk 39, KT & I sur, dk blew down. Fidelity Explo. Synd.'s Paul O'Henry 1, lot 2, sec 49, KT & I sur, dr 2342 ft, sand 2185-2213 ft, show heavy gas pressure. Parr & Ponder's Sam Michalk et al 1, lot 5, blk 37, KT & I sur, dr 1225 ft.

LEE COUNTY—McNeill Pet. Co.'s G. B. Bately 1, Wm. Nichols sur, 14 mi nw Lexington, dr 1350 ft.

LIVE OAK COUNTY—Benco Oil Co.'s Elizabeth Mahoney 1, Mark Killely sur, 3 mi w Three Rivers, prep to re-dr. Mills Bennett's Walton & Shipp 1, 990 ft el, 330 ft sl 129-ac tr, P. Salinas sur No. 11, 3½ mi ne McNeill field, set csg, sd to lay new gas line. Earl Callaway et al's W. R. Lyne 1, 859.6 ft swl, 1198.3 ft sel sec 74, M. M. Lyne sur Ad. 763, lcn; Moozgemba 1, 330 ft nel and nwl lot 122, Geo. West sub, blk A, sec 113, S. L. Williams sur, lcn. Geo. West Heirs 1, 895.5 ft nel, 1231 ft sel sec 255, BS&F sur, ab 113, mim. (These wells replace tests originally announced for Holland Oil Co., contract having been made with Callaway for three Cook Mountain tests). Henderson Coquat's Reagan 1, McGloin sur, sd 1240 ft. Gem Oil Co.'s J. E. Lyne 1, sec 134, M. M. Lyne, ab 718, fsh 3465 ft. Houston Oil Co.'s Cartwright 32, M. Trudo sur, Lucas area, sd 6787 ft. Lion O&R Co.'s P. E. McNeill 1, blk 9, Jane Curry sur, ne outpost well McNeill field, sand 4363-81 ft, comp 128 bpd, ¼ ch. Ray S. Nixon et al's Chamberlain Mortgage Co. W. Hill sur, blk 8, sec 174, 3 mi s Fashing, elev 325 ft, top Jackson 45 ft, Mirando 1024-58 ft, Pettus 1239-48 ft, both show sw, dr 1290 ft. E. W. Turner's J. W. Walker 1, blk 9, C. Simmon's sub, dr 350 ft. J. O. Whittington et al's Little 2, 2350 ft nel, 330 ft sel of tr in M. M. Shipp sur, 1 mi n McNeill field, sp.

LA SALLE COUNTY—S. Killingsworth's L. Yeager 1, lot 10, blk 5, sec 94, td 2001 ft, reinstate, was abd at this level, now setting csg to rd.

MAVERICK COUNTY—Thompson & Streeter's Joseph Wipff 1, 1800 ft sl, 330 ft wl, sec 18, 7 mi w Chittim field, 10 mi n Eagle Pass, lcn for 2500-ft test.

McMULLEN COUNTY—Bussa Oil Co.'s F. B. Horton 1, James A. Jean sur No. 20, 3 mi sw Tilden, sp and set 40 ft sur csg. Darby Pet. Co.'s E. R. Hagist 1-C, sec 108, Loma Alto, Mirando sand 2624-28 ft, dst 14 thribles sw, dd. John C. Gibson's Masur & McDowell 1, sec 19, HT&B Ry sur, 4 mi sw Tilden, coring 986 ft; G. C. West 1, lot 1, blk 4, sec 14, HT&B Ry sur No. 1092, 5 mi sw Tilden, sd 465 ft. Humble's J. W. Atkinson 1, sec 13, Loma Alto, dr 2003 ft, delayed acct weather. Loma Alto Co.'s L. Jacob 5, W. H. Jacob sur, w Jacob field, dr 900 ft. C. W. Points et al's Fahler 1, Geo. Pittuck sur, 5 mi w Calliham, td 1004 ft, to set 8-in csg to td and perf. Texas Inland O&G Co.'s H. L. Lark 1-A, M. O'Boyle sur, ½ mi s Jacob field, dry and abd 893 ft. Texio Oil Co. & Illinois Pet. Co.'s J. W. Atkinson 2, sec 13, dst 2161-2249 ft, show nothing, dd.

MEDINA COUNTY—Callahan & Roberts R. Taylor 1, A. Brushet sur No. 135, 5 mi sw Hondo, sp and sd. Joe Dupree's Hugo Batot, John Ball sur No. 1478, 7 mi sw Hondo, dr 425 ft. Gates & Hill's Odem 1, H. Castro sur No. 174, 5 mi sw Hondo, dr 308 ft, set 6⅝-in csg 273 ft. Letro Oil Corp.'s F. B. Forest 1, 1928 ft nl, 1908 ft el sec 69, 1½ mi ne Ina field, 1½ mi nw Adams field, sp.

NUECES COUNTY—A. F. Holliday's J. Griffith 1, Geo. Frank sur No. 416, Saxet area, 5598-5602 ft, 295 lbs pressure, some mud and 56 gr oil, ¾-in chokes top and bottom, set csg, dr out plugs. Magnolia's Bobby Baldwin 1, sec 39, J. S. McGregor sur, 4 mi s Clarkwood, sand 2774-79 ft, comp 18 bph, 25.8 gr oil, low pressure, opens new field. Southern Min. Co.'s Rand Morgan 1, Elliott sur, 2¾ mi sw Saxet field, testing 7195 ft.

REAL COUNTY—H. J. Heartwell et al's L. J. Haby 2, AB&M sur No. 175, fsh below 3200 ft; plans new test 1½ mi to east.

REFUGIO COUNTY—J&C Co.'s J. F. Welder 1, 1590 ft nwl, 670 ft nel of J. Farley sur, ab 150, nw Greta field, lcn. Hewitt & Daugherty's M. F. Lambert 19, blk 21, Hardwick sur, se Greta field, sand 6260-67 ft, dst 1000 ft 39 gr pipe line oil, good gas pressure, 10 min, set csg, prep to dr plubs.

SAN PATRICIO COUNTY — Benson & Jones' E. H. Welder 1, sec 38, Welder sur, s of Plymouth, sp. Continental and Atkins & O'Neill's J. F. Welder 3, Juan Hart gr, ½ mi of Angelita field, td 5561 ft, whipstock 5397 ft, dr 5428 ft, sdtr hole. Heep oil Corp.'s E. H. Welder 2-E, sec 46, Welder sub, Plymouth area, td 5667 ft, show o and sw, pb and test; E. H. Welder 3-E, sec 46, Welder sub, Plymouth area, coring 5500 ft. Magnolia's Corpus Christi B&T Co. 1, H. H. Hunter sur, 9000 ft sw, Plymouth field, dst 5595-5600 ft, 330 ft pipe line oil, 330 lbs, 6 min, setting csg. Plymouth Oil Co.'s E. H. Welder 4-C, sec 48, Welder sub, Plymouth pool, cleaning, 5639 ft; E. H. Welder 5-C, sec 45, Welder sub, Plymouth pool, dst 5690 ft sand, 600 ft pipe line oil, 12 min, set csg, wocs; E. H. Welder 6-C, sec 48, Welder sub, Plymouth pool, dr 5075 ft; E. H. Welder 7-C, sec 45, Welder sub, Plymouth pool, dr 3000 ft; E. H. Welder 8-C, sec 49, Welder sub, Plymouth pool, ru; E. H. Welder 1-D, Portillo sur, se Sinton field, td 6680 ft, pb 5925 ft, wocs; Violet Oil Co.'s E. H. Welder 1, sec 47, Welder sub, sw, Plymouth field, dr 4425 ft.

STARR COUNTY—Accumulative Roy. Co.'s H. F. Ferry 1, lot 8, blk 15, B&B sub, por 86, e of Rio Grande City, dr 2480 ft. C. R. Borah et al's A. Guerra 1, sh 6, San Jose gr, 2 mi n La Reforma, fsh 3517 ft. John H. Clopton's Kelsey Bass 1, blk 5, sec 10, por 86, e Rio Grande City, sd 4098 ft, ran electric formation tester. H. C. Harter's Sanchez 2, lot 3, sh 72, por 72, 9 mi n Roma, bailing o and w 503 ft. Hughston Oil Co.'s Wood-Gregg 1-A, por 84, w Rio Grande City, sd 3360 ft. Pedernal Oil Co.'s Hicks & Phelps 1, El Pedernal gr, (formerly Crawford et al), dr 2200 ft. A. Nix et al's Starr County Cattle Co. 1, blk 57, JL sub, por 89, sw Barbacoas field, td 2715 ft, pb and perf csg 2245-56 ft, to test. W. W. Zimmerman's F. Doyno 1, blk 1, tr 4, por 81, n Rio Grande City field, sand 1444-50 ft, complete 75 bpd on pump.

VICTORIA COUNTY—Crown Central Pet. Co.'s Schovajsa 1, lot 15, Rupley sur, sw Placedo discovery, ru and sd (corrected). Eastern Texas Oil Co.'s Henderson & Pickering 1, blk 19, Benavides sur, Placedo, rotating 6029 ft; J. E. Schovajsa 1, lot 14, Rupley sur, 1 mi sw Placedo field, td 4789 ft, pb and perf 4760 ft, hole full oil; E. Williams 1, E. Bene-

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vides, ½ mi ne Placedo field, ru (corrected). Gillespie & Superior's Brandt 1, lot 11, Rupley sur, Placedo field, td 6255 ft, pb 4000 ft, whipstock and re-dr; J. Janis 1, Nancy Dean sur, Placedo field, td 4756 ft, 7-in csg set 4737 ft, pb 4747 ft, comp 15 bph, ¼ ch. Magnolia Pet. Co.'s Henderson & Pickering 1, lot 18, E. Benevides sur, Placedo field, td 6394 ft, pb 4750 ft, set 7-in csg 4733 ft, completing. Martex Oil Co.'s Mitchell 1, E. Benevides sur, ¼ mi dis in Placedo field, dr 4860 ft. Texas Co.'s A. M. McFaddin 9, J. M. Rine sur, McFaddin area, sd 6200 ft, pb 4438 ft, swabbing. Trans-State Oil Co.'s Robt. Kanster 1, R. Manchola gr, W. Coleta Creek field, td 2833 ft, comp 7 bph, ¼ ch.

WEBB COUNTY—Allison et al's M. Jones 1, sec 1640, 1 mi sw Moca field, sd 910 ft. Rose B. Barnhardt de la Garza, sec 262, 2 mi n Carolina-Texas field, sd 2406 ft. Mills Bennett Oil Co.'s J. Lopez 3, 990 ft sl and 330 ft el of discovery tr, or w½ tr 10-B (100-ac), sec 73, skid on lcn. Senator James Neal et al's Laurel 1, sec CCSD & RGNG sur, 3 mi e Mirando City field, lcn. Smith et al's M. Jones 1, sec 1640, 1 mi sw Moca field, dr 650 ft. South Texas Oil Co.'s Laurel 1, blk 2, sur 269, Laurel area, dr 450 ft. W. H. Vernor, Tr.'s Jeffries Ranch, blk 13, sec 1453, 30 mi nw Laredo, lcn.

WILLIACY COUNTY—Kingwood Oil Co.'s Stillman Ranch 1, lot 16, blk 30, sh 44, Stillman Ranch sur, San Juan Carricitos gr, dr 4475 ft. South Texas Dev. Co.'s F. Armendiez 1-A, sh 4, prep to re-dr 3660 ft.

WILLIAMSON COUNTY—Fuch & Walters' F. Ollman, Bevil sur No. 56, sd 875 ft. J. W. Gabehardt et al's Lawrence 1, 450 ft sl and el 45-ac tr, S. Miller sur, dr 425 ft. Glass-Bros.' A. Albertson 1, 723 ft el, 1570 ft sl of 265-ac tr, P. Coursey sur, prep to sp. H. F. Goff et al's A. Klotz 1, W. Cartwright sur, sd 1210 ft. W. L. Stephens et al's J. P. Carlson 1, S. C. Jones, 10 mi sw Taylor, dr 940 ft.

ZAPATA COUNTY—Cox et al's S. Yzaguire 1, sh 17, por 15, S. Lopeno field, sd 2478 ft. H. C. Dean et al's J. M. G. Martinez 1, blk 34, sh B, W. R. Duke sub, Charco Redondo gr, sd 106 ft. Gem Oil Co.'s J. G. Remirez 1, sh 3, por 18, ¼ mi se Lopeno field, td 3502 ft, pb to comp as gasser. Humble's E. Dominguez 1, por 31, dr 1065 ft. Martinez & Daniels' A. M. Bruni 1, blk 44, San Ignacio sub, Borrego gr, td 1834 ft, set 7-in csg 1828 ft, dr plugs. J. J. O'Hern's Alexander 1, sh 7, por 22, n Lopeno field, dr 1965 ft. Duke Phillips' L. Gutierrez 1, 330 ft nl and wl of blk 26, La Huerta gr, 6 mi sw Escobas field, lcn. E. L. Smith Oil Co.'s R. Hinnant 1, blk 27, sec 307, td 2505 ft, pb 1400 ft, wocs. Stover et al's F. G. Martinez 1, blk 125, sh 1, El Grullo gr, dr 1125 ft.

TEXAS GULF COAST

ANGELINA COUNTY—Lee Tex Oil Co.'s A. H. Geisler 1, nw of Lay, B. J. Thompson sur, was blowing gas at the end of the week from 2053 ft. Bryan & Lyon's Frank Allen 1, nw of Lufkin, Barr & Davenport sur, dk.

AUSTIN COUNTY—Deering & Kayser's T. A. McClenton 1, se of Bellville, Thos. Bell sur, sd 2360 ft.

BRAZORIA COUNTY—Amerada Pet. Co.'s Houston Farms Dev. Co. 1, Rattlesnake Mound, Perry & Austin sur, No. 106, heaving shale 4450 ft. Harrison & Abercrombie's Bernard River Land Co. 2, Old Ocean, Chas. Breen sur, dr shale 7516 ft. Quintana Pet. Co.'s G. L. Wood 1, e of Nash Dome, Thos. Alberr sur No. 4, dr sand 5310 ft. The Texas Co.'s Freeport Sulphur Co. 1, e of Canal, Arecla sur, making 50 barrels per day by heads from 3425 ft.

CHAMBERS COUNTY—Glen McCarthy & R. A. Mason's R. M. White 1, nw of Anahuac, J. McGahey sur, preparing to set csg on oil sand at 6950 ft.

COLORADO COUNTY—Clyde Creighton et al's H. Witte 1, s of Bernardo, H. Witte sur, woc 350 ft. Coyle-Concord's Fee 1, I&GN sur, sec 45, setting casing 352 ft. Trans-State Oil Co.'s Frank Weinhuhn 1, due north of Columbus, F. A. Zisemmerscheidt sur, dr shale 3289 ft.

FT. BEND COUNTY—C. B. Bunte's S. J. Winston 1, n of Rosenberg, S. Isaacs sur, dk.

GALVESTON COUNTY—Coast Pet. Corp.'s Maco Stewart 1, w of Dickinson, W. K. Wilson sur, washing 8016 ft.

GRIMES COUNTY—Dillinger & Hammer's Lane 1, e side of County, R. P. Stewart sur, dk.

HARRIS COUNTY—Graham & Gardner's A. E. Hegar 1, n of Hockley, John W. Clifton sur, dr shale 4625 ft. Hebert, Still & Hooper's A. Backman 1, Ogburn prospect, J. Ogburn sur, abd 6516 ft.

JASPER COUNTY—Marathon Oil Co.'s Jasper County Lbr. Co. 1, se of Jasper, T. C. Holmes sur, ru.

JEFFERSON COUNTY—Sun's Hebert & Broussard 1, s of Lovall Lake, B. Blackmon sur, dr shale 6769 ft.

LIBERTY COUNTY—Jack Frazier's Lynott Buffon 2, n of Hardin, J. Robeson sur, preparing to run 7 inch csg to 7552 ft.

MATAGORDA COUNTY — Continental's Feife 1, Citrus Grove, J. S. Chriswell sur, setting 11¾ in csg 6573 ft. Helmerick & Payne's H. B. Hawkins 1, Sheppards Mott, D. A. McCarthy sur, dr shale 5015 ft. H. M. Smith's Wadsworth Estate 1, s flank of Sheppards Mott Dome, S. R. Fisher sur, standing 8418 ft.

MONTGOMERY COUNTY — V. E. Bolyard's Atkinson 1, n of Pinehurst, R. George sur, sd 3360 ft. Gholson et al's A. Parks 1, nw of Willis, J. Lindley sur, sd 3769 ft. Paul Sanders et al's Tex L. L. L. Co. 1, Splendora, Walker County School Land sur, dr 4910 ft.

ORANGE COUNTY—Dick Schwab's Banker & Rutan 1, Jett sur, coring 7080 ft.

SAN AUGUSTINE COUNTY—The Hunter Co.'s Long Bell Lbr. Co. 2, Galloway sur, lcn.

SAN JACINTO COUNTY — Darby-Jones-McBee Drilling Co.'s J. R. Bennett 1-A, David Beer sur, dr shale 3450 ft.

TRINITY COUNTY—Gulf's Trinity County Lbr. Co. 3, s of Apple Springs, A. E. Westall sur, abd 3009 ft.

WHARTON COUNTY—Texas Co.'s Pierce Estate A-2, 2100 ft nw of A-1, I&GN sur, sec 39, comp 18 barrels per hour from 4710 ft.

WYOMING

ALBANY COUNTY — Ohio's Two Rivers Land & Cattle Co.'s 1, sw ne 8-17n-74w, dr 150 ft.

CONVERSE COUNTY — Chadron-Osage Oil Co.'s State 1, cse 16-32n-69w, dr 650 ft.

CARBON COUNTY—General Pet. Corp.'s Whitford 1, sw se ne 24-20s-84w, sd 4400 ft, moving in new equipment.

FREMONT COUNTY — Monongahela Oil Co. and Sidney H. Keoughan's Wisda 1, ne se 13-28n-93w, dr 3700 ft.

WESTON COUNTY — Conway Oil Co.'s Government 1, se se ne 7-41n-60w, dr 2000 ft.

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This Week with the Industry's EQUIPMENT SUPPLIERS

CHARLES A. McCOLLUM
Becomes Manager of Sales for The National Supply Company

Charles McCollum Becomes Sales Manager for National Supply

Charles A. McCollum, who has been resident manager of the Houston district sales office of The National Supply Company of Texas, has been transferred to Tulsa to become manager of sales of The National Supply Company, succeeding H. G. Trimble, who resigned effective July 1.

C. R. Patterson, who has been store manager at Houston for several years, has been elevated to resident manager, and his former duties will be taken over by H. D. Bassett, store manager at Kilgore, Texas.

Tepco Earth Products Plant Now Operating

The new plant of Tulsa Earth Products Company started into full operation June 8. Products include paint pigment, admix for cement and concrete, filter powder for use in filtering gasoline and cleaning fluid, powdered lime used in drilling mud for the oil industry. All products will be brand named "Tepco". The company also will engage in the grinding and pulverizing.

The company is headed by Elfred Beck, president. The other officers are D. R. Howard, vice president, and N. C. Beck, secretary and treasurer.

The National Supply Company Is Enlarging Houston Shops

The National Supply Company has launched a major construction program at Houston on a 12-acre site recently acquired near Navigation Boule-

C. R. PATTERSON
Houston Resident Manager for The National Supply Company

Farrel-Birmingham Sales Conference Held During June

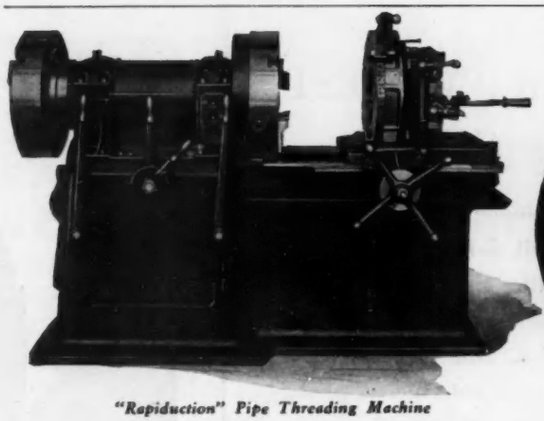
During the week of June 24 the sales force of Farrel-Birmingham Company, Inc., met at the company's offices at Ansonia, Conn., for the annual sales conference. Sales representatives were present from New York, New Jersey, Buffalo, Akron, Chicago and Los Angeles.

In the absence of President N. W. Pickering, who was in Europe, Carl Hitchcock, vice president, presided at the opening session of the conference, and outlined the program that would be followed during the remainder of the week.

The following sessions were devoted to discussions of the company's products, with particular reference to engineering, manufacturing and sales problems involved. New developments and improvements in design which have been made during the past year were explained by the sales and engineering department heads.

Dannenbaum Appointed Coppus Engineering Co. Representative

Announcement has been made of the appointment of M. N. Dannenbaum Company of Houston, Texas, as district representatives in the Texas territory for Coppus Engineering Corporation of Worcester, Massachusetts. The Dannenbaum Company, located in the Shell Building, will handle a complete line of Coppus air filters, which includes the air compressor and engine filters, unit type filters and the new Coppus Dry-Matic filter.



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vard and on the H. B. & T. Railway. It will include a two-story office building; three fireproof warehouses for the accomodation of oil field supplies; and a large maintenance and repair shop. The latter unit is a new addition to the company's facilities at Houston, and will be operated by The National-Superior Company, manufacturing branch of The National Supply Company.

Leonard Price Is Promoted By Thermoid Rubber Company

Leonard Price has been promoted to supervisor of mechanical rubber goods sales for the Pacific Coast Division of Thermoid Rubber Company, Trenton, N. J. His headquarters will remain in Los Angeles and his supervision of mechanical rubber goods sales to the oil industry will continue as in the past, but his duties will be greatly enlarged to take in industrial sales as well.

L. E. Kitson has been transferred from Thermoid's automotive replacement division to district manager of the mechanical rubber goods division on the Pacific Coast, and will succeed Mr. Price in the local Southern California territory.

Dowell Incorporated Announces Promotions in Personnel Staff

C. E. Mangold, who has been district manager for Dowell Incorporated at Shreveport, Louisiana, has been promoted to the general sales staff with headquarters at Tulsa, Oklahoma. Mr. Mangold is one of the original staff of Dowell Incorporated and previously has represented his company in Kentucky and Kansas

C. A. Prince, treating engineer at Many, Louisiana, succeeds Mr. Mangold as district manager for Louisiana.

Claire B. Bishop has been made office manager for Shreveport.

C. P. Parsons and A. D. Stoddard Made Vice Presidents of Company

C. P. Parsons, in charge of sales and advertising, and A. D. Stoddard, chief engineer, have been made vice presidents of Halliburton Oil Well Cementing Company, according to information received from Duncan, Oklahoma, the company's headquarters. Both have been with the company several years and are well known throughout the petroleum industry. Parsons will continue in charge of sales and advertising and Stoddard will be in charge of manufacturing.

John Isaacs Returns from Mid-Continent Business Trip

John Isaacs, assistant to the president of Vernon Tool Company, Ltd., Los Angeles, has recently returned from a three months' business trip during which he covered Texas, Oklahoma and Louisiana, in the interests of the McNeely vibrating rotary mud screen manufactured by Vernon Tool Company, and sold in the Mid-Continent and Gulf Coast territories by Baroid Sales Company, Houston, Texas. J. W. McNeely of Vernon Tool Company is now in the Mid-Continent working in conjunction with Baroid Sales Company on sales and service.

New Book on the Geology of Natural Gas Is Published

The American Association of Petroleum Geologists has announced the publication of a new book entitled "Geology of Natural Gas." This book consists of 38 papers prepared by 47 authors. It is a comprehensive geologic treatise of the occurrence of natural gas on the North American Continent. Many structural maps and stratigraphic data are included.

The book has articles on fields in Alberta, Ontario, Quebec, California, Washington, Idaho, Oregon, Utah, Montana, Wyoming, Colorado, New Mexico, Texas, Kansas, Oklahoma, Arkansas, Louisiana, Michigan, Illinois, Indiana, Kentucky, Ohio, Tennessee, Mississippi, Alabama, New York, Pennsylvania, West Virginia and Mexico. It also includes articles on valuation, reserves, helium, rare gases and the industry in general.

The book, which includes 1200 pages, with 250 illustrations, may be obtained for $6.00 by addressing the American Association of Petroleum Geologists, Box 1852, Tulsa, Oklahoma. Members of the association may obtain the book for $4.50.

Bearing Data

SKF Industries, Inc., Philadelphia, has covered a wide scope of bearing information in its 76-page edition of Engineering Data Sheets just off the press. Subjects include index of bearing types; selection, mountings and lubrication of ball and roller bearings; self-aligning ball bearings; single row ball bearings; double row ball bearings; spherical roller bearings; cylindrical roller bearings; ball thrust bearings; conversion tables; transmission appliances; district offices; and tables, showing principal dimensions, shaft fits and tolerances, housing fits and tolerances, removable sleeves, shaft locknuts and lockwashers, corner radii and shaft fillets.

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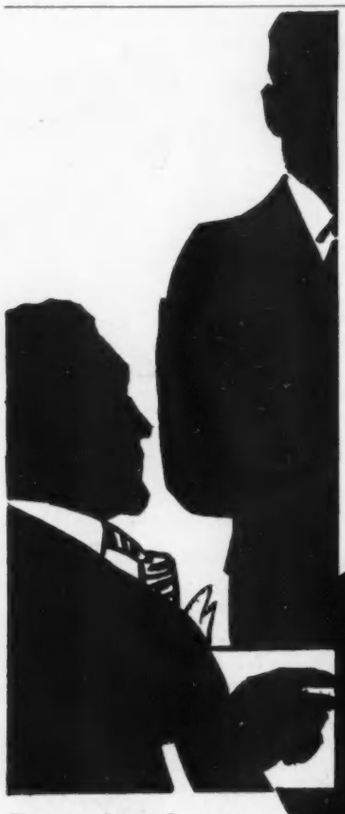

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Without Reserve

"Have you a lawyer to represent you?"

"No, sir. I am going to speak the truth."

To Sit On?

"Do you want the shoulders padded, my little man?"

"Naw, pad the pants."

At Least Break

Golf is like a love affair: If you don't take it seriously, it's no fun; if you do take it seriously, it breaks your heart.

Antique

Teacher: "William, construct a sentence using the word archaic."

William: "We can't have archaic and eat it, too."

Gone Where—

A doctor was attending a dangerous case, where a Scottish butler was engaged. On calling one forenoon he said to Donald:

"I hope your master's temperature is much lower today than it was last night."

"I'm not sae very sure about that," replied the butler, "for he died this morning."

Slow Death

Gentlemen of the jury, the driver of the car stated he was going only four miles an hour. Think of it. The long agony of my poor, unfortunate client, the victim, as the car drove slowly over his body.

Old Friend Now

"My wife ran away with my best friend."

"Was he good-looking?"

"I don't know. Never met the fellow!"

The Log

The doctor was questioning the new nurse about her latest patient. "Have you kept a chart of his progress?"

The nurse blushingly replied, "No, but I can show you my diary."

When Tight, Too

"What part of the car causes the most accidents?"

"The nut that holds the wheel."

'Owls

"Wot's the 'orrible racket?"

"That an owl."

"Hi know bally well hit's an 'owl, but' oo in 'ell's 'owling?"

Fair Play

Smith got married. The evening of his first pay-day he gave his bride $14.00 of his $15.00 salary and kept only a dollar for himself. But the second pay-day Smith gave his wife $1.00 and kept $14.00 for himself.

"Why, John," she cried in injured tones. "How on earth do you think I can manage a whole week on a paltry dollar?"

"Darned if I know," he answered. "I had a rotten time myself last week; now it's your turn."

The Best of Us

"You're lazy, you're worthless, you're bad-tempered, you're shiftless, and you're a thorough liar."

"Well, my dear, no man is perfect."

Uneasy Heads—Both

"What is the difference between a king and a president?"

One amazing six-year-old came back with the following answer:

"Kings have queens and presidents have private secretaries."

Empties?

First Lady: "Do you always look under the bed?"

Second Lady: "Always."

"Ever find anything there?"

"Only in old-fashioned hotels."

Essentials.

"There are two things, son, that are vitally necessary if you are to succeed in business."

"What are they, dad?"

"Honesty and sagacity."

"How do you define honesty?"

"Always—no matter what happens or how adversely it may affect you—always keep your word once you have given it."

"And sagacity?"

"Never give your word."

Deafening

And did the audience applaud?

Applaud! They made about as much noise as a rubber heel on a feather bed.

Not a Call

Parson—My fren's, I'se got a call to another church.

Deacon—how much more does you-all git?

Parson—Three hundred dollahs.

Deacon—You should be more conspicuous in your language, Parson. You-all hasn't had a call, you has had a raise.

Old Grudge

A parson was summoned for driving his car dangerously.

"Now," said the magistrate, "you say you were going at only eighteen miles an hour, but the policeman declares you were proceeding at forty. I don't like to doubt either of you. Can you think why he declares you were going at that rate? Is there a grudge he owes you?"

"No," replied the clergyman. "I can't think of anything, unless it is that I married him three years ago."

Devoutly to Be Wished

"I had a most enjoyable time at the dentist's this afternoon."

"I don't see how that could be."

"It's true. When I went in, another dentist was working on my dentist's teeth."

At Sunday School

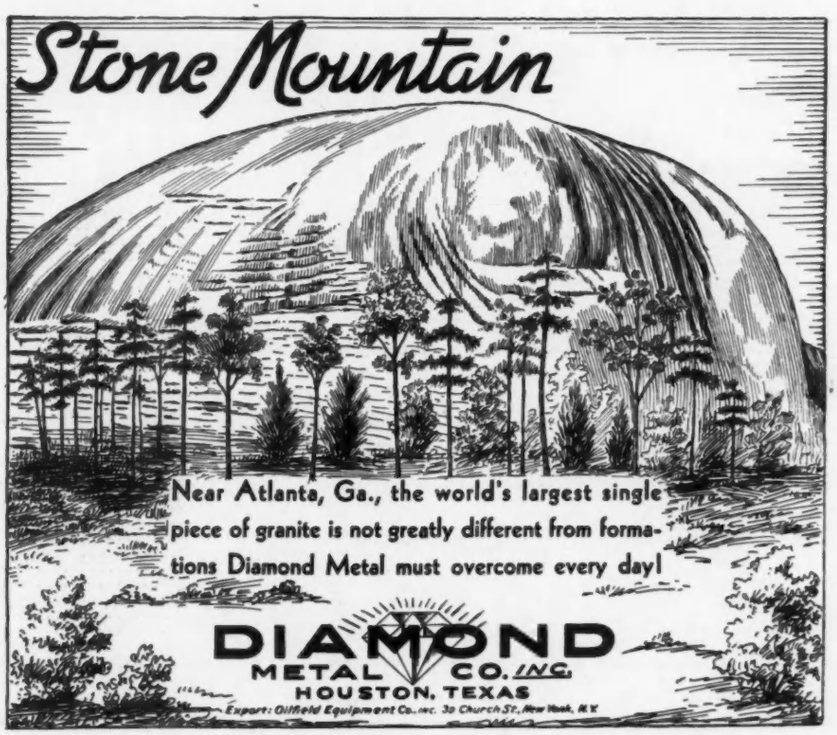
"Can you tell something about Good Friday, James?"

"Yes'm; he was the fellow that did the housework for Robinson Crusoe."

Straphangers

"Madam, you are standing on my foot."

"I beg your pardon. I thought it belonged to the man sitting down."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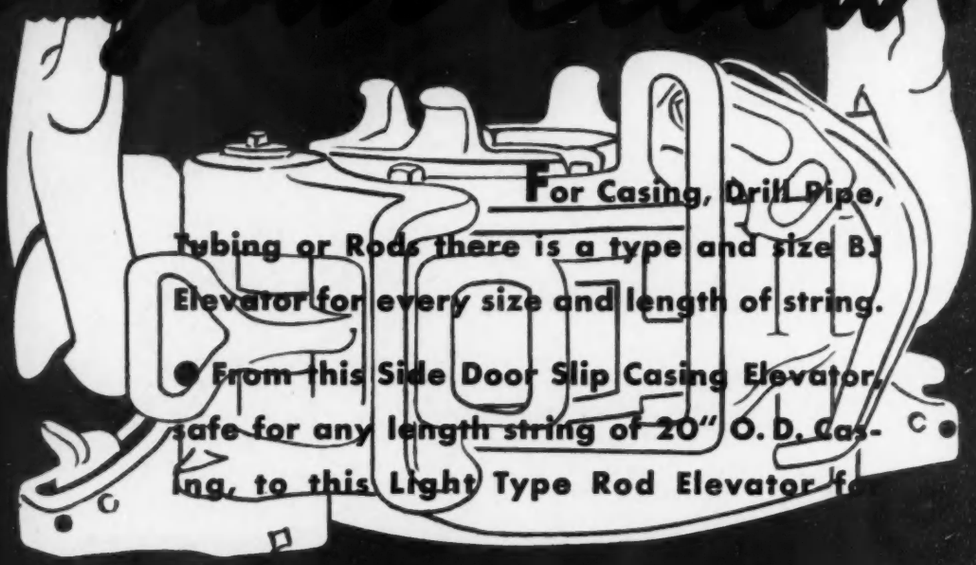

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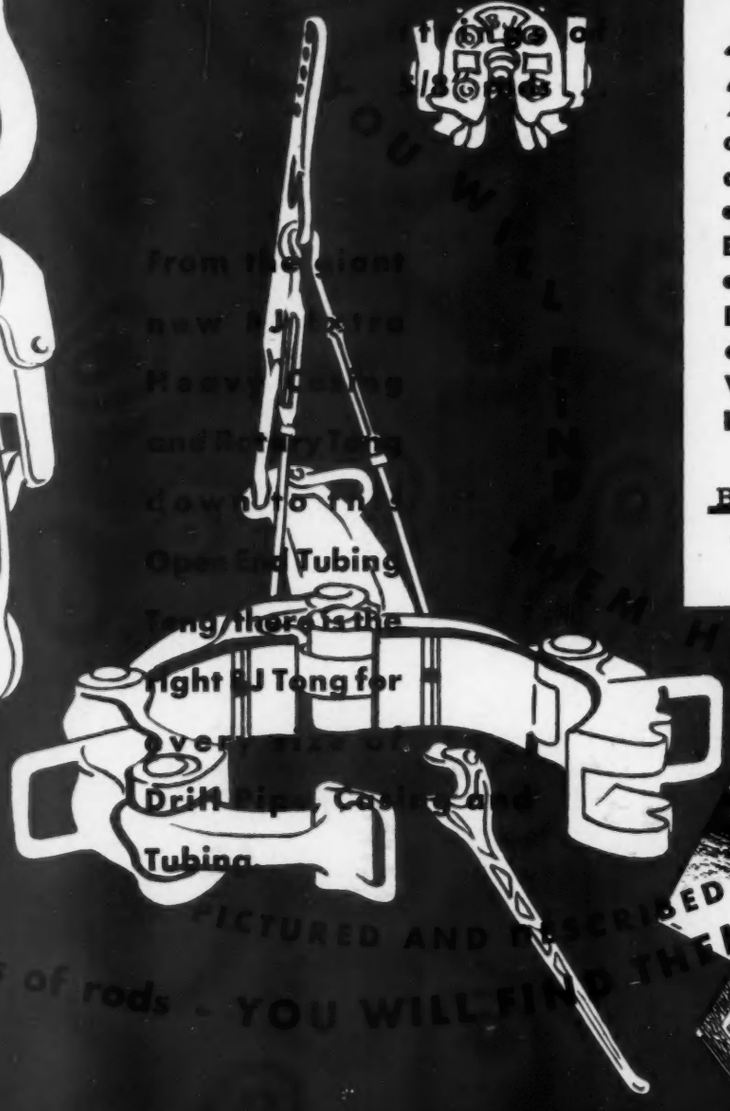

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